

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

A335
R88SD

RE A FORM 803
(Rev. June 1963)

SPECIFICATIONS AND DRAWINGS FOR 14.4 / 24.9 Kv. LINE CONSTRUCTION



U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY

SEP 4 - 1963

C & R-PREP.

RURAL ELECTRIFICATION ADMINISTRATION
U. S. DEPARTMENT OF AGRICULTURE

AD-33 Bookplate
(1 = 63)

NATIONAL

A
G
R
I
C
U
L
T
U
R
A
L



LIBRARY Reserve
A335
R88Sp
26989

SPECIFICATIONS FOR CONSTRUCTION1. General

All construction work shall be done in a thorough and workman-like manner in accordance with the Staking Sheets, Plans and Specifications, and the Construction Drawings.

The Sixth Edition of the National Electrical Safety Code shall be followed except where local regulations are more stringent, in which case local regulations shall govern.

2. Distributing Poles

In distributing the poles, large, choice, close-grained poles shall be used for transformer, deadend, angle, and corner poles.

3. Pole Setting

The minimum depth for setting poles shall be as follows:

Length of Pole (feet)	Setting in Soil (feet)	Setting in All Solid Rock (feet)
20	4.0	3.0
25	5.0	3.5
30	5.5	3.5
35	6.0	4.0
40	6.0	4.0
45	6.5	4.5
50	7.0	4.5
55	7.5	5.0
60	8.0	5.0

"Setting in Soil" specifications shall apply:

- a. Where poles are to be set in soil.
- b. Where there is a layer of soil of more than two (2) feet in depth over solid rock.
- c. Where the hole in solid rock is not substantially vertical or the diameter of the hole at the surface of the rock exceeds approximately twice the diameter of the pole at the same level.

"Setting in All Solid Rock" specifications shall apply where poles are to be set in solid rock and where the hole is substantially vertical, approximately uniform in diameter and large enough to permit the use of tamping bars the full depth of the hole.

Where there is a layer of soil two (2) feet or less in depth over solid rock, the depth of the hole shall be the depth of the soil in addition to

5b

the depth specified under "Setting in All Solid Rock" provided, however, that such depth shall not exceed the depth specified under "Setting in Soil."

On sloping ground, the depth of the hole always shall be measured from the low side of the hole.

Poles shall be set so that alternate crossarm gains face in opposite directions, except at terminals and deadends where the gains of the last two poles shall be on the side facing the terminal or deadend. On unusually long spans, the poles shall be set so that the crossarm comes on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.

Poles shall be set in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain so that the conductors shall be in line.

Poles shall be raked against the conductor strain not less than one inch for each ten feet of pole length nor more than two inches for each ten feet of pole length after conductors are installed at the required tension.

Pole backfill must be thoroughly tamped the full depth. Excess dirt must be banked around the pole.

4. Grading of Line

When using high poles to clear obstacles such as buildings, foreign wire crossings, railroads, etc., there shall be no upstrain on pin-type insulators in grading the line each way to lower poles.

5. Guys and Anchors

Guyss shall be placed before the conductors are strung and shall be attached to the pole as shown in the Construction Drawings.

All anchors and rods shall be in line with the strain and shall be so installed that approximately six inches of the rod remain out of the ground. In cultivated fields or other locations, as deemed necessary, the projection of the anchor rod above earth may be increased to a maximum of 12 inches to prevent burial of the rod eye. The backfill of all anchor holes must be thoroughly tamped the full depth.

When a cone anchor is used, the hole, after the anchor has been set in place, shall be backfilled with coarse crushed rock for two feet above the anchor, tamping during the filling with the remainder of the hole to be backfilled and tamped with dirt.

6. Locknuts

A locknut shall be installed with each nut, eyenut or other fastener on all bolts or threaded hardware such as insulator pins, upset bolts, double arming bolts, etc.

7. Conductors

Conductors must be handled with care. Conductors shall not be tramped on nor run over by vehicles. Each reel shall be examined and the wire shall be inspected for cuts, kinks, or other injuries. Injured portions shall be cut out and the conductor spliced. The conductors shall be pulled over suitable rollers or stringing blocks properly mounted on pole or crossarm if necessary to prevent binding while stringing.

The neutral conductor should be maintained on one side of the pole (preferably the road side) for tangent construction and for angles not exceeding 30 degrees.

With pin-type insulators the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at angles. Pin-type insulators shall be tight on the pins and on tangent construction the top groove must be in line with the conductor after tying in.

For neutral and secondary conductors on poles, insulated brackets (Material Item da) may be substituted for the single and double upset bolts on angles of 0° to 5° in locations known to be subject to considerable conductor vibration.

All conductors shall be cleaned thoroughly by wirebrushing before splicing or the installation of a connector or clamp. A suitable inhibitor shall be used before splicing or applying connectors over aluminum conductor.

8. Splices and Deadends

Conductors shall be spliced and deadended as shown on the Construction Drawings. There shall be not more than one splice per conductor in any span and splicing sleeves shall be located at least ten feet from the conductor support. No splices shall be located in Grade B crossing spans and preferably not in the adjacent spans.

9. Taps and Jumpers

Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Where slack is not shown on the Construction Drawings it will be provided by at least two bends in a vertical plane, or one in a horizontal plane, or the equivalent. In areas where aeolian vibration occurs, special measures to minimize the effects of jumper breaks shall be used as specified.

All leads on equipment such as transformers, reclosers, etc., shall be a minimum of 1/0 copper conductivity. Where aluminum jumpers are used, a

connection to an unplated bronze terminal shall be made by splicing a short stub of copper to the aluminum jumper using a suitable aluminum compression sleeve.

10. Hot-Line Clamps and Connectors

Connectors and hot-line clamps suitable for the purpose shall be installed as shown on Guide Drawings. On all hot-line clamp installations, the clamp and jumper shall be so installed so that they are permanently bonded to the load side of the line, allowing the jumper to be de-energized when the clamp is disconnected. This applies in all cases, even where the line layout is such that the tap line is in actuality the main back to the power source.

11. Lightning Arrester Gap Settings

The external gap electrodes of lightning arresters, combination arrester-cutout units, and transformer mounted arresters shall be adjusted to the manufacturers' recommended spacing. Care shall be taken that the adjusted gap is not disturbed when the equipment is installed.

12. Conductor Ties

Ties shall be in accordance with Construction Drawings. Hot-line ties shall not be used at Grade "B" crossings.

13. Sagging of Conductors

Conductors shall be sagged in accordance with the conductor manufacturers' recommendation. All conductors shall be sagged evenly. The air temperature at the time and place of sagging shall be determined by a certified etched glass thermometer.

The sag of all conductors after stringing shall be in accordance with the conductor manufacturers' recommendations, except that a maximum increase of three inches of the specified sag in any span will be acceptable. However, under no circumstances will a decrease in the specified sag be allowed.

14. Secondaries and Service Drops

Secondary conductors may be bare or covered wires or multi-conductor service cable. The conductors shall be sagged in accordance with the manufacturers' recommendations.

Conductors for secondary underbuild on primary lines will normally be bare except in those instances where prevailing conditions may limit primary span lengths to the extent that covered wires or service cables may be used. Service drops shall be covered wire or service cable.

Secondaries and service drops shall be so installed as not to obstruct climbing space. There shall not be more than one splice per conductor in

any span, and splicing sleeves shall be located at least ten feet from the conductor support. Where the same covered conductors or service cables are to be used for the secondary and service drop, they may be installed in one continuous run.

15. Grounds

Ground rods shall be driven full length in undisturbed earth in accordance with the Construction Drawings. The top shall be at least 12 inches below the surface of the earth. The ground wire shall be attached to the rod with a clamp and secured to the pole with staples. The staples on the ground wire shall be spaced two feet apart except for a distance of eight feet above the ground and eight feet down from the top of the pole where they shall be six inches apart.

All equipment shall have at least two connections from the frame, case or tank to the multi-grounded neutral conductor.

The equipment ground, neutral wires, and lightning-protective equipment shall be interconnected and attached to a common ground wire.

16. Clearing Right-of-Way

In preparing the right-of-way, trees shall be removed, underbrush cleared and trees trimmed so that the right-of-way shall be clear from the ground up and of the width required. Trees fronting each side of the right-of-way shall be trimmed symmetrically unless otherwise specified. Dead trees beyond the right-of-way which would strike the line in falling shall be removed. Leaning trees beyond the right-of-way which would strike the line in falling and which would require topping if not removed shall either be removed or topped except that shade, fruit, or ornamental trees shall be trimmed and not removed unless otherwise authorized.

Where RCI units are specified, the right-of-way shall be cleared in accordance with the specifications and, in addition, all stumps one-half inch in diameter and larger shall be sprayed in accordance with the following specifications:

A mixture consisting of eight pounds acid equivalent of a low volatile 2, 4, 5-T ester (2 gallons of concentrate) mixed with 48 gallons of No. 2 fuel oil shall be used for spraying. The mixture shall be agitated thoroughly during mixing and application to ensure a uniform distribution of the chemical throughout the oil.

The entire periphery of each stump to be treated shall be sprayed by thoroughly saturating the bark from freshly cut surface to ground line, including exposed roots, until runoff is effected at ground line. Bark shall not be wet from dew, fog or rain at time spraying is done.

Spraying shall be performed in such manner, at such pressure, and under such wind conditions that drift of spray material to adjacent vegetation will be avoided. Spraying should be performed the same day that brush and tree cutting removal work is completed but in no event later than 72 hours from the time tree cutting is performed. If moisture or wind conditions prevent treatment in accordance with the above, spraying shall be performed as soon thereafter as possible.

To facilitate application, supervision and inventory of RC assembly units, the spray solution shall be colored by the addition of an oil soluble red dye suitable for use in the 2, 4, 5-T ester and oil mixture. The dye shall be equivalent to "Oil Red" or "Red O."

INDEX OF CONSTRUCTION DRAWINGS

Single-Phase:

VAL, VALA	0° to 5° angle, single primary support
VAL-1, VAL-1A	0° to 5° angle, double primary support
VAL-2	0° to 5° angle, double primary and neutral supports
VA2	Double primary supports, maximum transverse loading -- 500 Lbs./pin (5° to 30° maximum angle)
VA2-3	Double primary and neutral supports, maximum transverse loading -- 500 Lbs./pin (5° to 30° maximum angle)
VA3	Vertical construction, 30° to 60° angle
VA4	Vertical construction, 60° to 90° angle
VA5	Vertical deadend (single)
VA5-1, VA5-2, VA5-2A	Single phase tap
VA5-3, VA5-4	Single phase tap
VA6	Vertical Deadend (double)
VA7, VA7-1	Crossarm construction--deadend (single)
VA8	Crossarm construction--deadend (double)
VA9	Crossarm construction--double line arm
VA9-1	Crossarm construction--single line arm

Two-Phase:

VB1, VB1A	Crossarm construction-- 0° to 5° angle, single primary support
VB1-1, VB1-1A	Crossarm construction-- 0° to 5° angle, double primary support
VB2	Crossarm construction--double primary supports, maximum transverse loading--750 Lbs./pin (5° to 30° maximum angle)
VB3, VB3A	Vertical construction-- 30° to 60° angle
VB4-1, VB4-1A	Vertical construction-- 60° to 90° angle
VB5-1, VB5-1A	Vertical construction--deadend (single)
VB7, VB7-1	Crossarm construction--deadend (single)
VB8	Crossarm construction--deadend (double)
VB9, VB9-2	Crossarm construction--double line arm
VB9-1, VB9-3	Crossarm construction--single line arm

Three-Phase:

VC1, VC1B	Crossarm construction-- 0° to 5° angle, single primary support
VC1-1, VC1-1A	Crossarm construction-- 0° to 5° angle, double primary support
VC1-2	Crossarm construction-- 0° to 2° angle (large conductors)
VC1-3	Crossarm construction-- 0° to 5° angle, double primary support (large conductors)

VC1-4	Crossarm construction-- 2° to 5° angle (large conductors)
VC1-5	Crossarm construction--single primary support with overhead neutral
VC-2	Crossarm construction--double primary support, maximum transverse loading--500 Lbs./pin (5° to 30° maximum angle)
VC2-1	Crossarm construction--double primary support, maximum transverse loading--750 Lbs./pin (5° to 30° maximum angle)
VC2-2	Crossarm construction--double primary support, large conductors, maximum transverse loading--1000 Lbs./pin (5° to 30° maximum angle)
VC3	Vertical construction-- 30° to 60° angle
VC3L	Vertical construction-- 30° to 60° angle (large conductors)
VC3-1	Vertical construction-- 10° to 20° angle (large conductors)
VC4-1	Vertical construction-- 60° to 90° angle
VC4-1L	Vertical construction-- 60° to 90° angle (large conductors)
VC5-1	Vertical construction--deadend (single)
VC5-1L	Vertical construction--deadend (single) (large conductors)
VC7, VC7-1	Crossarm construction--deadend (single)
VC8	Crossarm construction--deadend (double)
VC8-1	Crossarm construction--deadend (double)
VC8-2	Crossarm construction--deadend (double) (large conductors)
VC8-3	Crossarm construction--deadend (double) (large conductors with unbalanced loads)
VC9	Crossarm construction--double line arm
VC9-1	Crossarm construction--single line arm
VC9-2	Crossarm construction--double line arm, 0° to 5° angle (large conductors)
VC9-3	Crossarm construction--single line arm (large conductors)

Three-Phase, Double Circuit:

VDC-C1	Crossarm construction-- 0° to 5° angle, single primary support (2 crossarm type)
VDC-C1B	Crossarm construction-- 0° to 5° angle, single primary support with overhead neutral (2 crossarm type)
VDC-C1L	Crossarm construction-- 0° to 5° angle, single primary support (2 crossarm type) (large conductors)
VDC-C2-1	Crossarm construction-- 5° to 30° angle (2 crossarm type)
VDC-C2-1L	Crossarm construction--double primary supports, maximum transverse loading--1000 Lbs./pin (2 crossarm type) (large conductors) 5° to 30° maximum angle
VDC-C3	Vertical construction-- 30° to 60° angle
VDC-C4-1	Vertical construction-- 60° to 90° angle
VEL-1, VEL-2, VEL-3	Single down guy, through-bolt type
E2-1, E2-2, E2-3	Single overhead guy, through-bolt type
E3-2, E3-3, E3-10	Single down guy, wrapped type
E4-2, E4-3	Single overhead guy, wrapped type
VE5-1, VE5-2	Deadend guy, crossarm construction
VE6-2, VE6-3	Double down guy

VE7-2L, VE7-3L	Three down guys (large conductors)
VE8-2L, VE8-3L	Four down guys (large conductors)
E11, E12	Single loop guy, wrapped type

Anchor Assemblies:

F1-1 to F1-4	Line anchor assemblies
F2-1 to F2-4	Log anchor assemblies
F4-1	Service anchor assemblies
F5-1, F5-2, F5-3	Rock anchor assemblies
F6-1, F6-2, F6-3	Swamp anchor assembly

Transformer Assemblies:

VG10, VG66, VG106	Single phase transformer at deadend
VG10	Conventional transformer with tank-mounted cutout and arrester
VG66	Transformer with double gap and internal fuse
VG106	Self protected transformer
VG19, VG65, VG105	Single phase transformer at one-phase tangent
VG19	Conventional transformer with tank mounted cutout and arrester
VG65	Transformer with double gap and internal fuse
VG105	Self protected transformer
VG39, VG67, VG136	Single phase transformer on three-phase circuit
VG39	Conventional transformer with tank mounted cutout and arrester
VG67	Transformer with double gap and internal fuse
VG136	Self protected transformer
VG150, VG150	One autotransformer
VG210	Two transformers, cluster-mounted, open wye, for 120/240 volt power loads
VG310	Three transformers, cluster-mounted, ungrounded wye delta, for 120/240 volt power loads
VG311	Three transformers, cluster-mounted, three wire, grounded delta, for 240 or 480 volt power loads
VG312	Three transformers, cluster-mounted, four wire, grounded wye-grounded wye, for 120/208 volt power loads

Secondary Assemblies:

J5 to J12	Secondary assemblies
-----------	----------------------

Service Assemblies:

K10, K11, K14	Single conductors
K10C	Cable
K10L, K11L, K14L	Large conductors

K11C, K14C, K15C Cable
K16C, K17L, K17 Ranch-type houses

Miscellaneous Assemblies:

VM2-11	Grounding assembly--ground rod type
VM2-12	Pole protection assembly--butt type
M2-15	Grounding assembly--ground rod type for sectionalizing air break switch
VM3-1A, VM3-4	One sectionalizing fuse cutout
VM3-2, VM3-3	Two or three sectionalizing disconnect switches
VM3-10A	One sectionalizing oil circuit recloser
VM3-16	Sectionalizing airbreak switch
VM3-19, VM3-20	Two or three sectionalizing oil circuit reclosers
VM3-19A, VM3-20A	Two or three sectionalizing oil circuit reclosers
VM3-23	One sectionalizing oil circuit recloser with by-pass switch
VM3-24, VM3-25	Two or three sectionalizing oil circuit reclosers with by-pass switches
VM3-24A, VM3-25A	Two or three sectionalizing oil circuit reclosers with by-pass switches
VM5-1 to 8	Miscellaneous primary assemblies
M5-9 to 16	Miscellaneous primary assemblies
M5-17 to 23	Miscellaneous primary assemblies

Regulators:

VM7-1	One voltage regulator assembly, platform mounted
VM7-3	Three voltage regulators, platform mounted

Metering Assembly Guide Drawings:

M8	Secondary metering, single phase, 120/240 volts
M8-6	Secondary metering, three phase, 120/240 volts, 4-wire delta
M8-9	Yard pole meter installation, pump service carried underground
M8-10	Yard pole meter installation, all building services carried underground
M8-11	Secondary metering, three phase, 120/208 volts, 4-wire grounded wye
M8-12	Secondary metering, three phase, 240 volts, 3-wire corner grounded delta

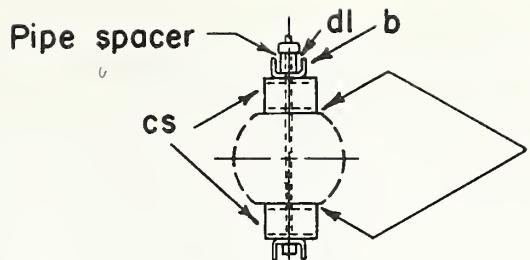
Arcing Horn Assemblies:

VM10-14	Single phase, arcing horn assembly guide
VM10-15	Three phase, arcing horn assembly guide

Guide Drawings:

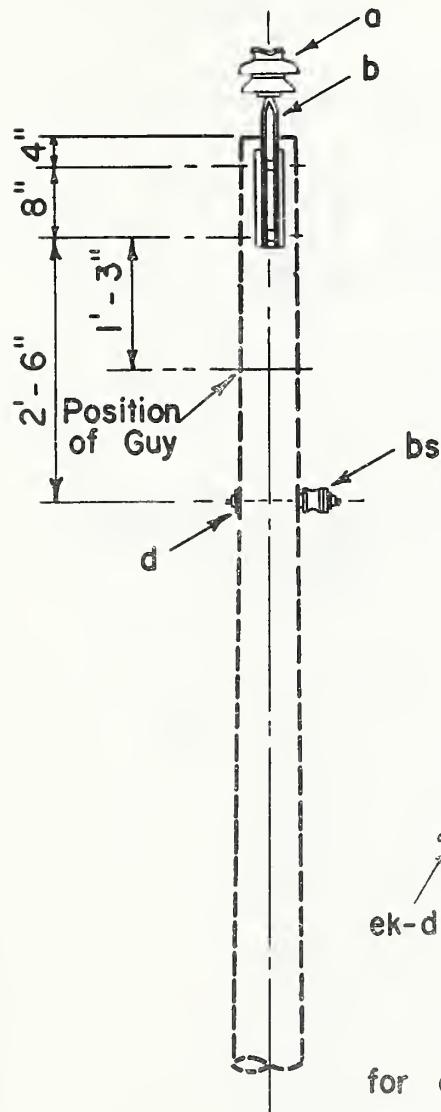
M19	Crossarm drilling guide
M20	Pole framing guide

M21	Angle construction guide, crossarm to vertical construction, 30° to 60° angle
M22-1	Tree trimming guide
M22-2	Tree trimming guide
M24	Cable service assembly guide
M24-1	Open wire service assembly guide
M24-10	Assembly guide of service mast for ranch-type house
M26-5	Security light installation guide (unmetered)
M27	Transformer connection guide, open wire services
M27-1	Transformer connection guide, triplex cable services
M27-2	Transformer connection guide, secondary underbuild
M28	Transformer connection and service take-off guide from secondary
VM29-1	Tap assembly guide
VM33-1 to VM33-6	Side arm assemblies
M40-1A	Tying guide--single insulator, one piece tie--copper type conductors with preformed armor rods
M40-1A2	Tying guide--single insulator, two piece tie, copper type conductors with preformed armor rods
M40-8	Hot line tying guide--copper type conductors with preformed armor rods
M40-10	Tying guide--single insulator, aluminum tie wire, ACSR conductor, straight or preformed armor rods
M40-11	Armor rods, ACSR conductors
M40-12	Preformed armor rods, ACSR conductors
M40-13	Preformed armor rods, copper type conductors
M40-17	Tying guide--double insulator, aluminum tie wire, ACSR conductor, straight or preformed armor rods
M41-1	Angle assembly guide, vertical construction, 30° to 60° angle, copper type conductors with preformed rods
M41-10	Angle assembly guide, vertical construction, 30° to 60° angle, ACSR conductors with straight or preformed armor rods
M42-3	Deadend assembly guide, deadend clamp method, copperweld copper and copper conductors
M42-11	Deadend assembly guide, deadend clamp method, ACSR conductors
M42-13	Deadend assembly guide, large conductors
M42-21	Deadend assembly guide, compression method, copper type conductors
M43-4	Tap assembly guide, copperweld copper and copper conductors
M43-10	Tap assembly guide, ACSR conductors
M45-20	Splicing guide, compression type, copper type conductors
M45-21	Splicing guide, compression type, ACSR conductor
M45-22	Splicing guide, compression type, ACSR conductors, 2/0 and larger 1/0 optional
M52-3, M52-4	Neutral identification and pole numbering guide
R1	Clearing right-of-way guide

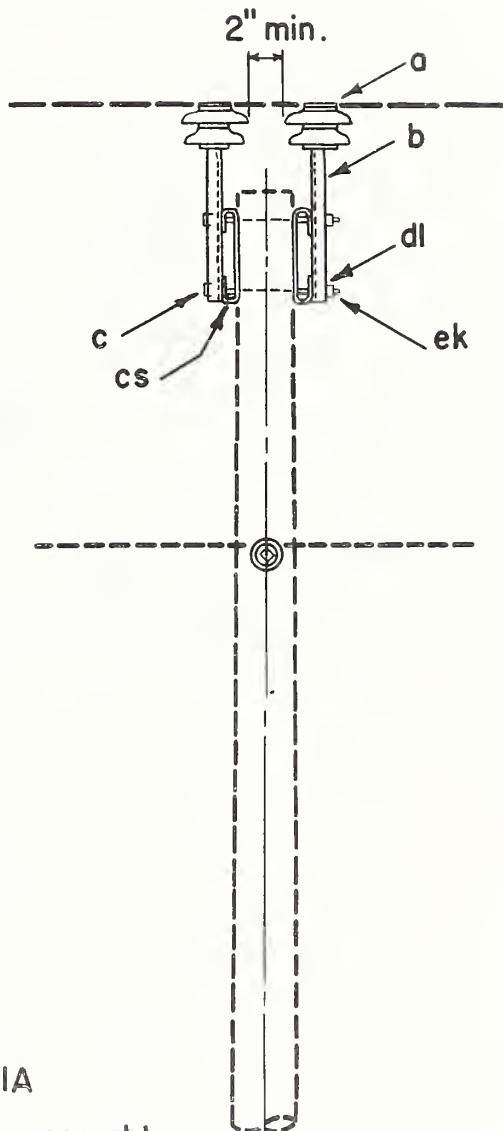


Pole to be gained on both sides, to provide flat surfaces for the brackets.

POLE TOP PIN ASSEMBLY

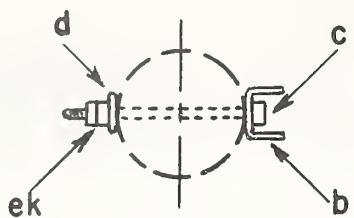


Specify VAI-IA
for offset neutral assembly

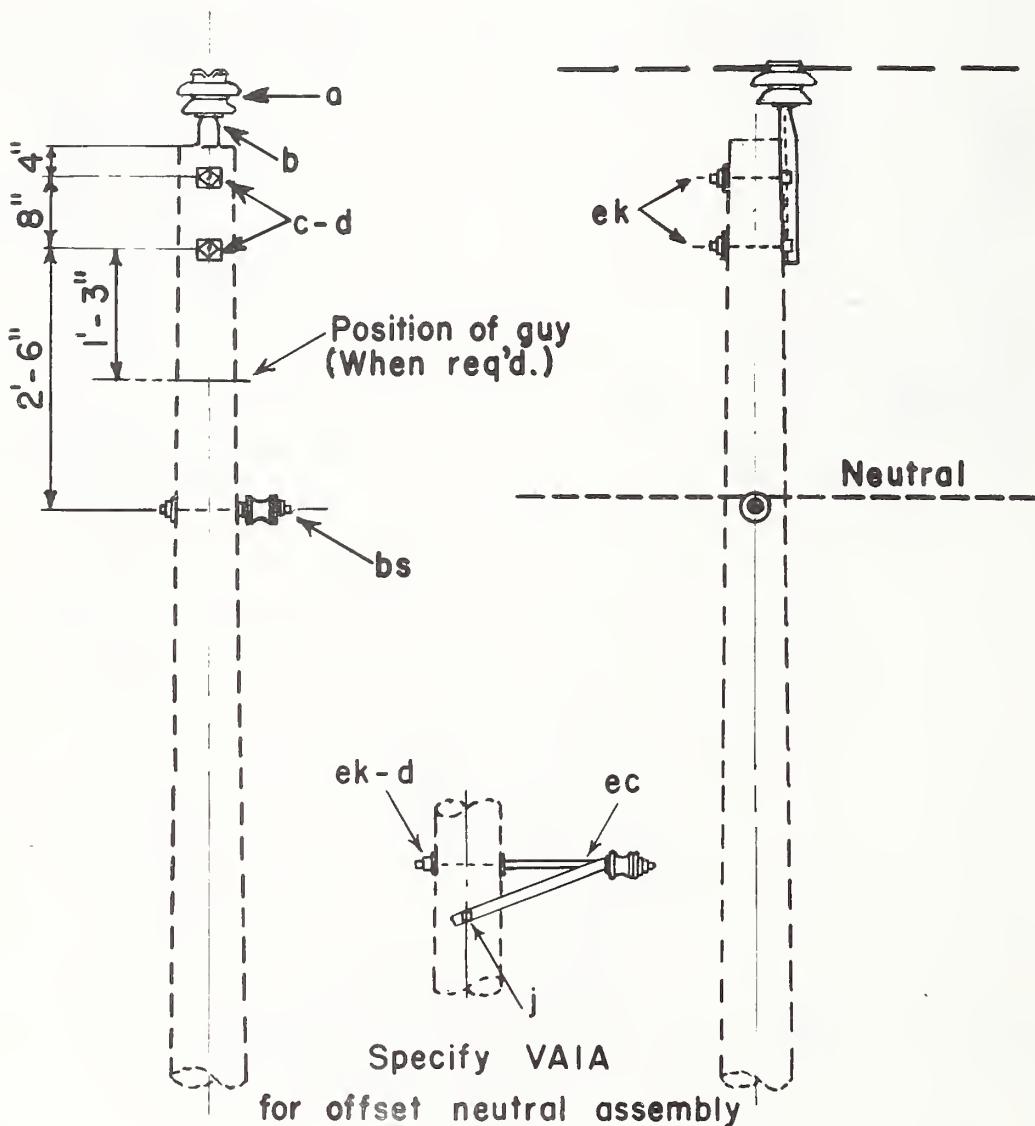


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 2	Insulator, pin type	bs 1	Bolt, single upset, insulated (VAI-I only)
b 2	Pin, pole top, 20"	cs 2	Bracket, pole top, 1/4" x 3"
c 2	Bolt, machine, 5/8" x req'd. length	dl 2	Pipe spacer, 3/4" dia.x 1 1/2"
d 1	Washer, square 2 1/4"	ek	Locknuts
j 2	Screw, lag, 1/2"x 4", (VAI-IA only)	ec 1	Bracket, offset, insulated, (VAI-IA only)

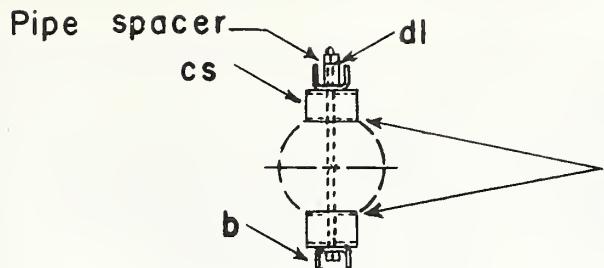
14.4/24.9 KV PRIMARY, 1-PHASE
0° TO 5° ANGLE, DOUBLE PRIMARY SUPPORT



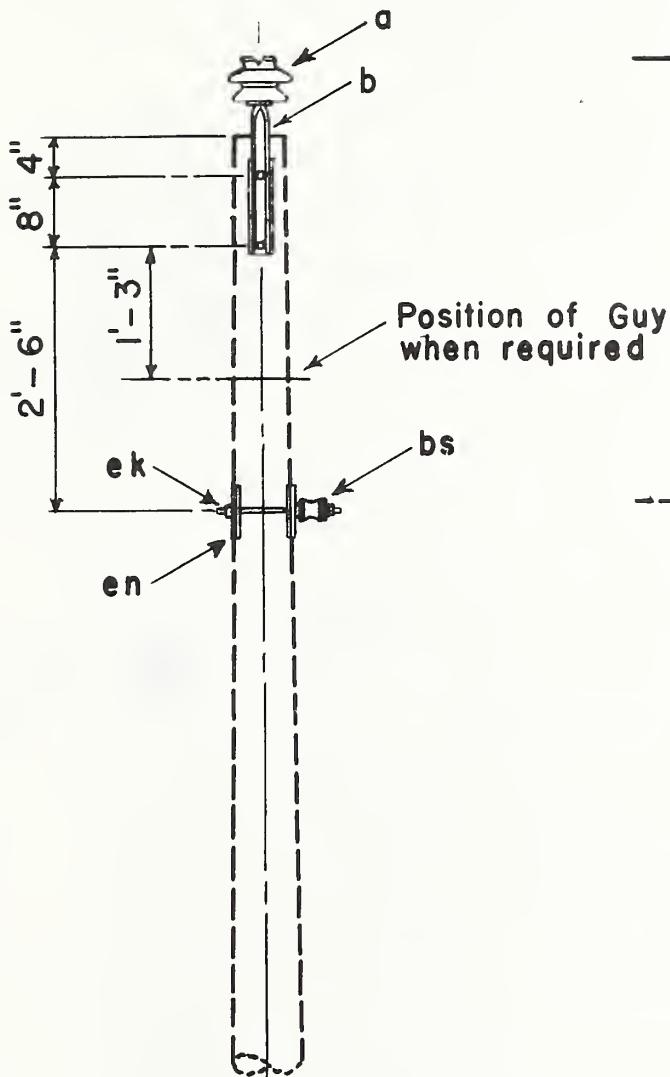
POLE TOP PIN ASSEMBLY



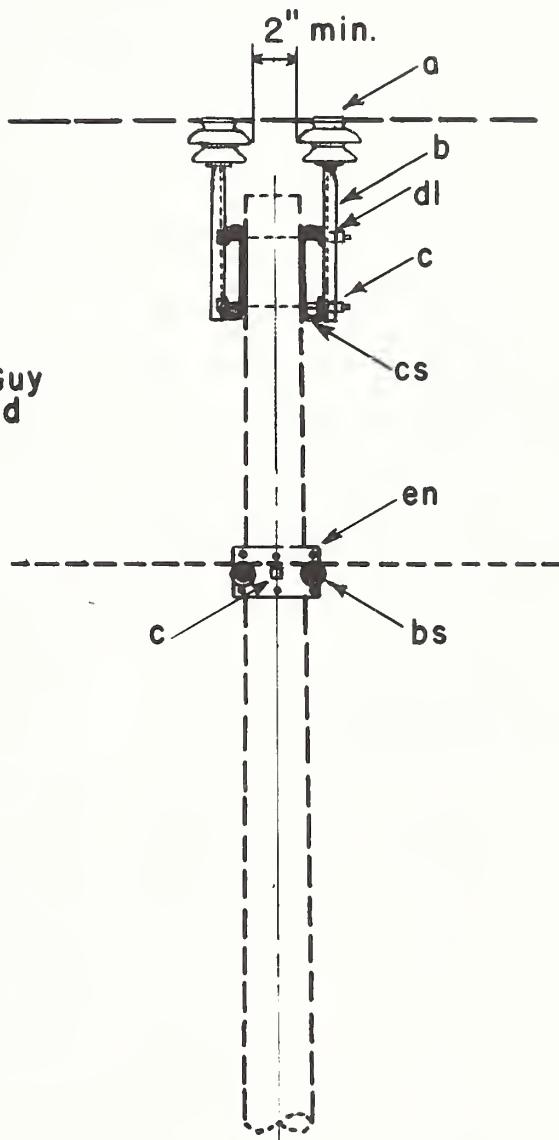
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 1	Insulator, pin type	d 3	Washer, square, 2 1/4"
b 1	Pin, pole top, 20"	bs 1	Bolt, single upset, insulated,(VAI only)
c 2	Bolt, machine, 5/8" x req'd. length	ek	Locknuts
j 2	Screw, lag, 1/2"x 4",(VAIA only)		
ec 1	Bracket, offset, insulated , (VAIA only)		
			14.4/24.9 KV PRIMARY 1- PHASE, 0° TO 5° ANGLE, SINGLE PRIMARY SUPPORT
			Jan. 1, 1963
			VAI, VAIA



**POLE TOP PIN
ASSEMBLY**

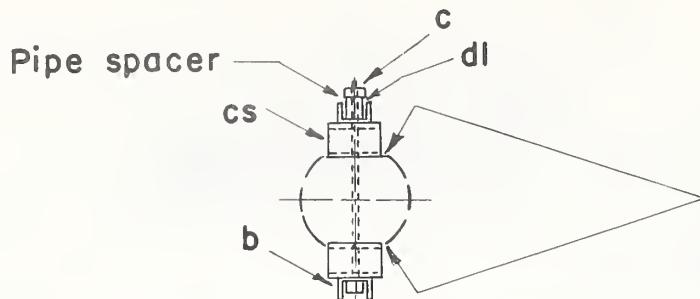


Note:
Pole to be gained on
both sides to provide
flat surfaces for brackets



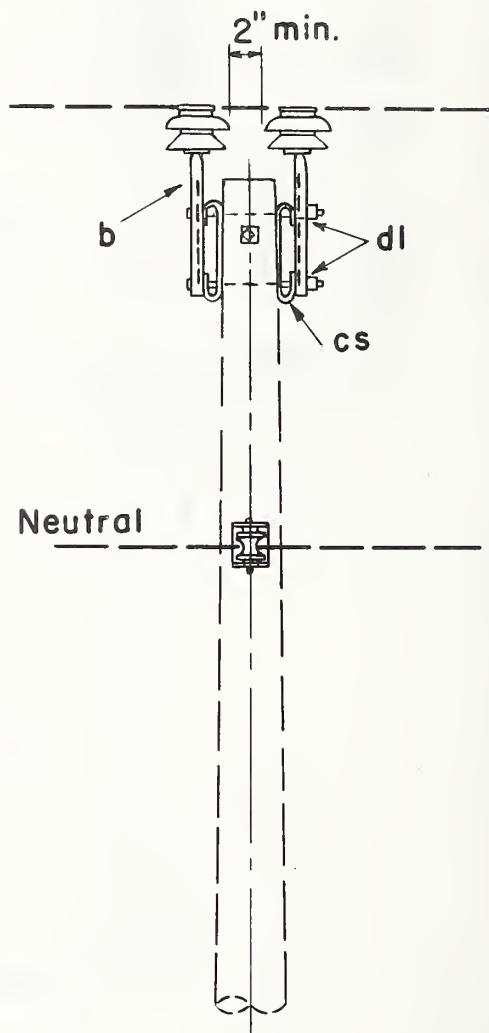
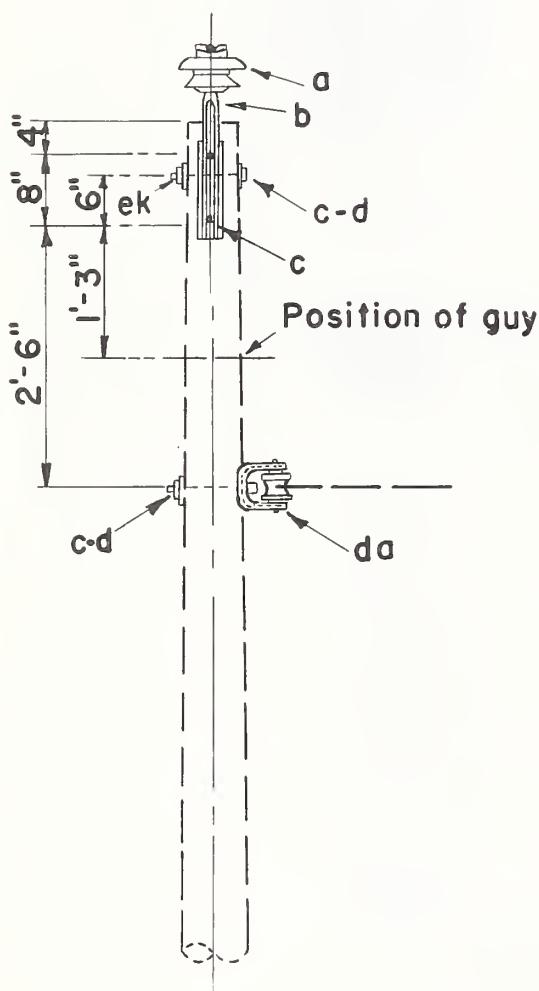
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	2	Insulator, pin type	cs	2	Bracket, pole top, $1/4'' \times 3''$
b	2	Pin, pole top, 20"	ek		Locknuts
c	3	Bolt, machine, $5/8'' \times$ req'd length	en	2	Plate, double support
bs	2	Bolt, single upset, insulated	dl	2	Pipe spacer, $3/4''$ dia. $\times 1 1/2''$

14.4/24.9 KV PRIMARY, 1-PHASE, 0° TO 5° ANGLE
DOUBLE PRIMARY AND NEUTRAL SUPPORTS



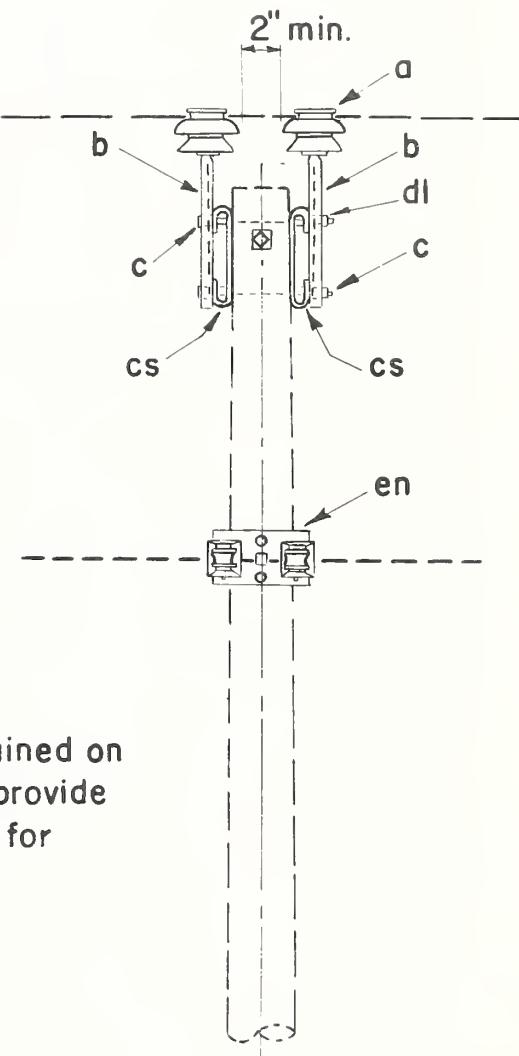
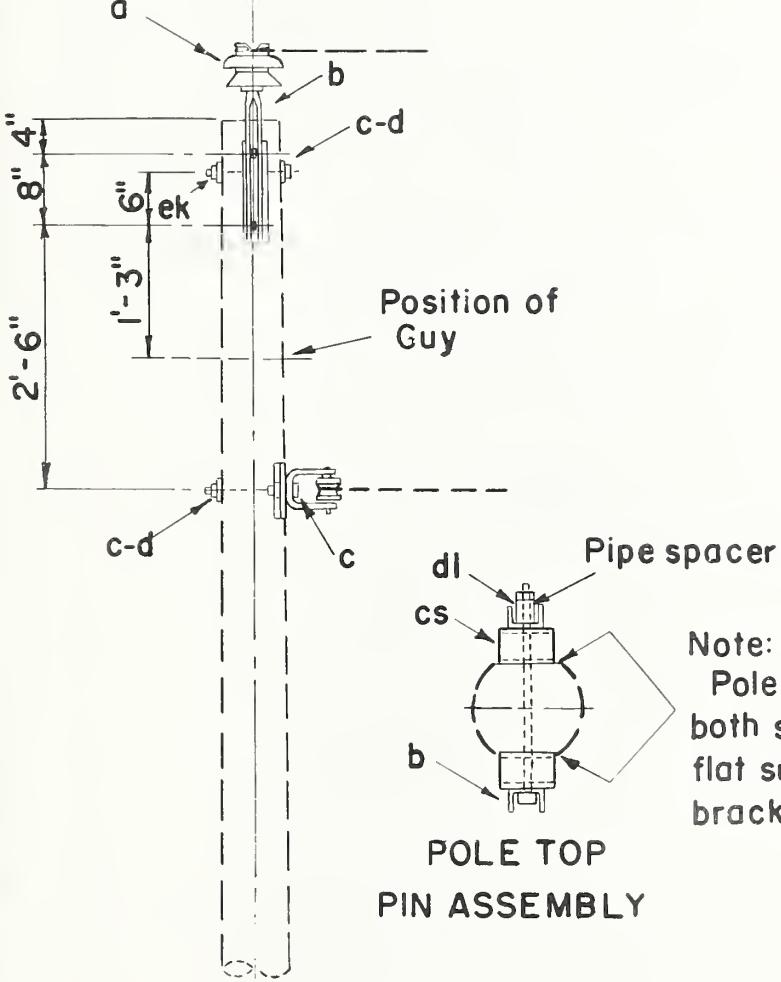
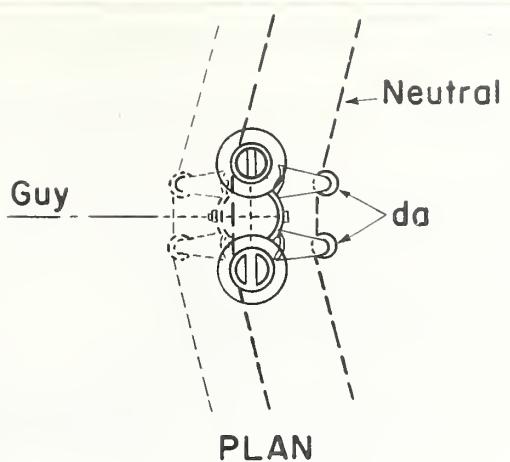
POLE TOP PIN
ASSEMBLY

Note:
Pole to be gained on
both sides to provide
flat surfaces for
brackets.



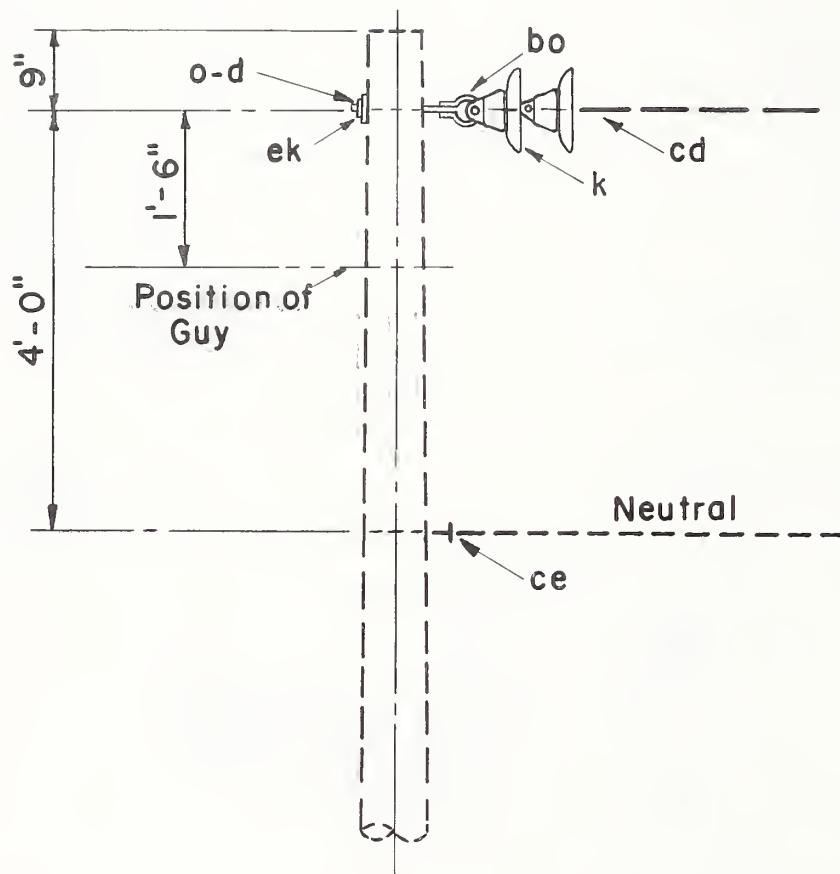
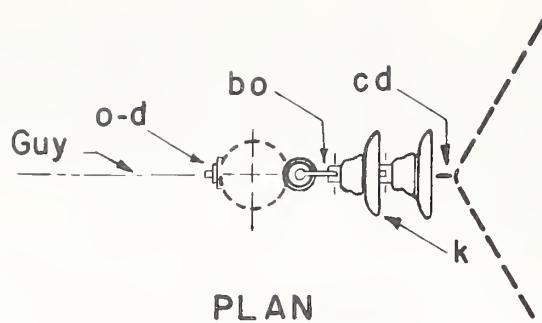
ITEM	NO. REQ'D	MATERIAL	ITEM	NO. REQ'D	MATERIAL
a	2	Insulator, pin type	cs	2	Bracket, pole top, $\frac{1}{4}'' \times 3''$
b	2	Pin, pole top, 20"	da	1	Bracket, insulated
c	4	Bolt, machine, $\frac{5}{8}'' \times$ req'd length	dl	2	Pipe spacer, pole pin, $\frac{3}{4}''$ dia. x $1\frac{1}{2}''$
d	3	Washer, square $2\frac{1}{4}''$	ek		Locknuts

14.4/24.9 KV. PRIMARY, 1 PHASE
DOUBLE PRIMARY SUPPORTS
MAX. TRANSVERSE LOADING 500 LBS./PIN
5° TO 30° (MAX. ANGLE)



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 2	Insulator, pin type	da 2	Bracket, insulated
b 2	Pin, pole top, 20"	dl 2	Pipe spacer, pole pin, $\frac{3}{4}$ " dia. x $1\frac{1}{2}$ "
c 6	Bolt, machine, $\frac{5}{8}$ " x req'd length	ek	Locknut
d 3	Washer, square $2\frac{1}{4}$ "	en 1	Plate, double support
cs 2	Bracket, pole top, $\frac{1}{4}$ " x 3"		

14.4/24.9 KV. PRIMARY, I-PHASE
DOUBLE PRIMARY AND NEUTRAL SUPPORTS
MAX. TRANSVERSE LOADING 500 LBS./PIN
5° TO 30° (MAX. ANGLE)

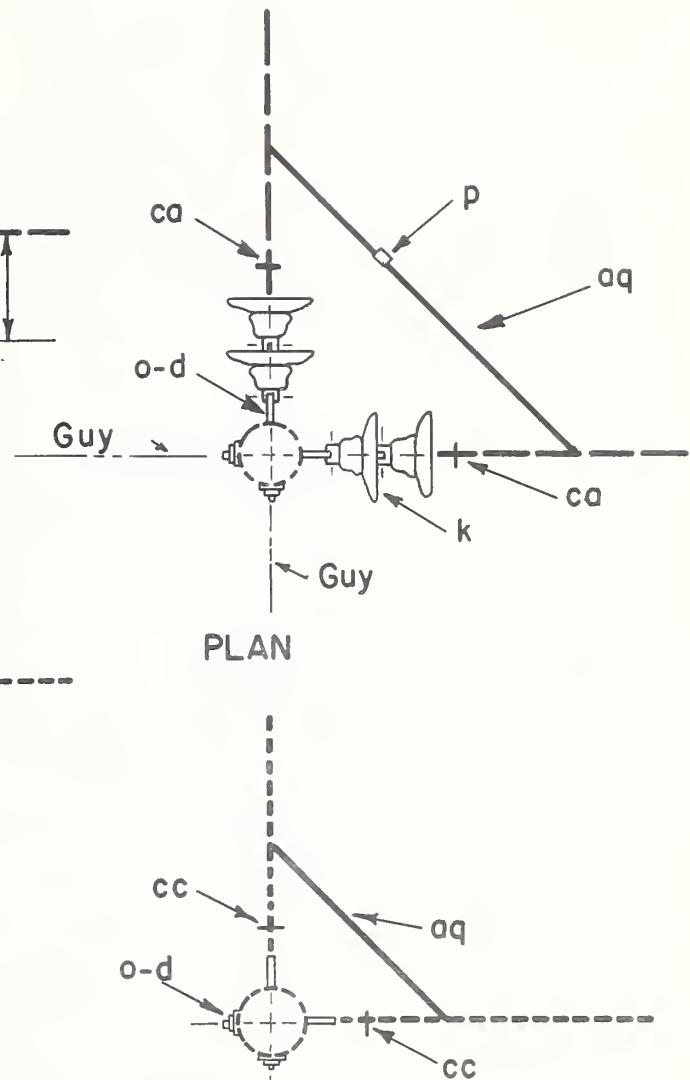
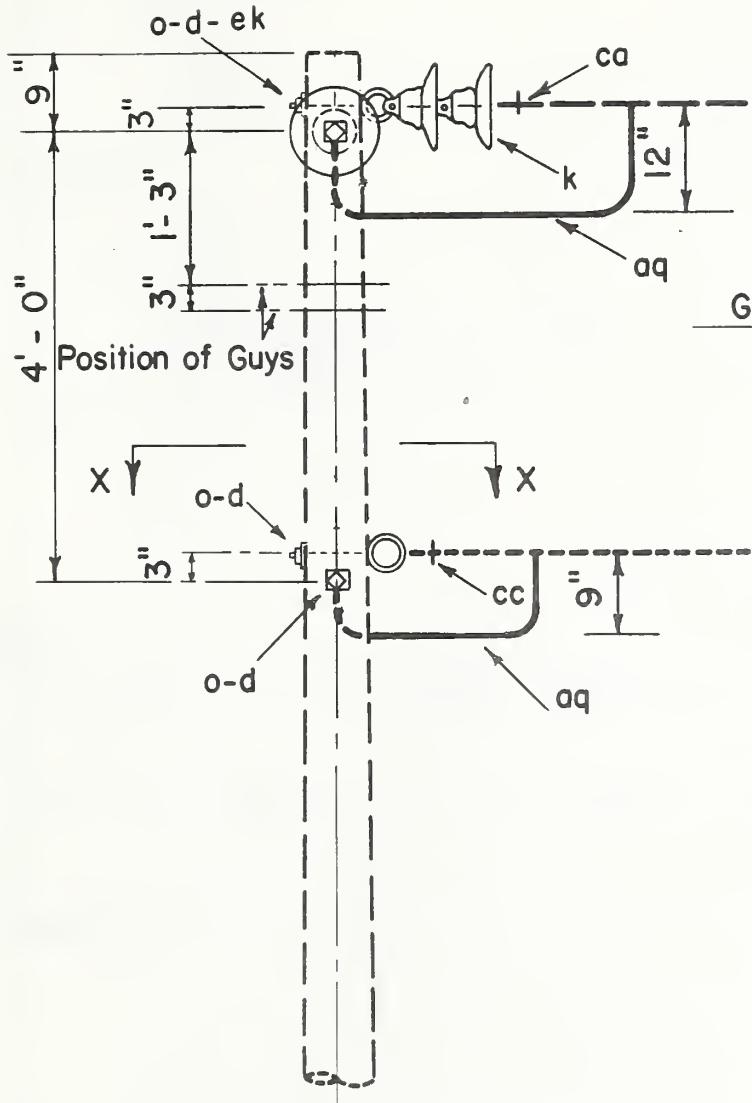


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 1	Washer, square $2\frac{1}{4}$ "	cd 1	Angle assembly, primary
k 2	Insulator, suspension, 10"	ce 1	Angle assembly, neutral
o 1	Bolt, eye, $\frac{5}{8}$ " x req'd length	ek	Locknuts
bo 1	Shackle, anchor		

14.4/24.9 KV.PRIMARY, I-PHASE
30° TO 60° ANGLE

Jan. 1, 1963

VA3

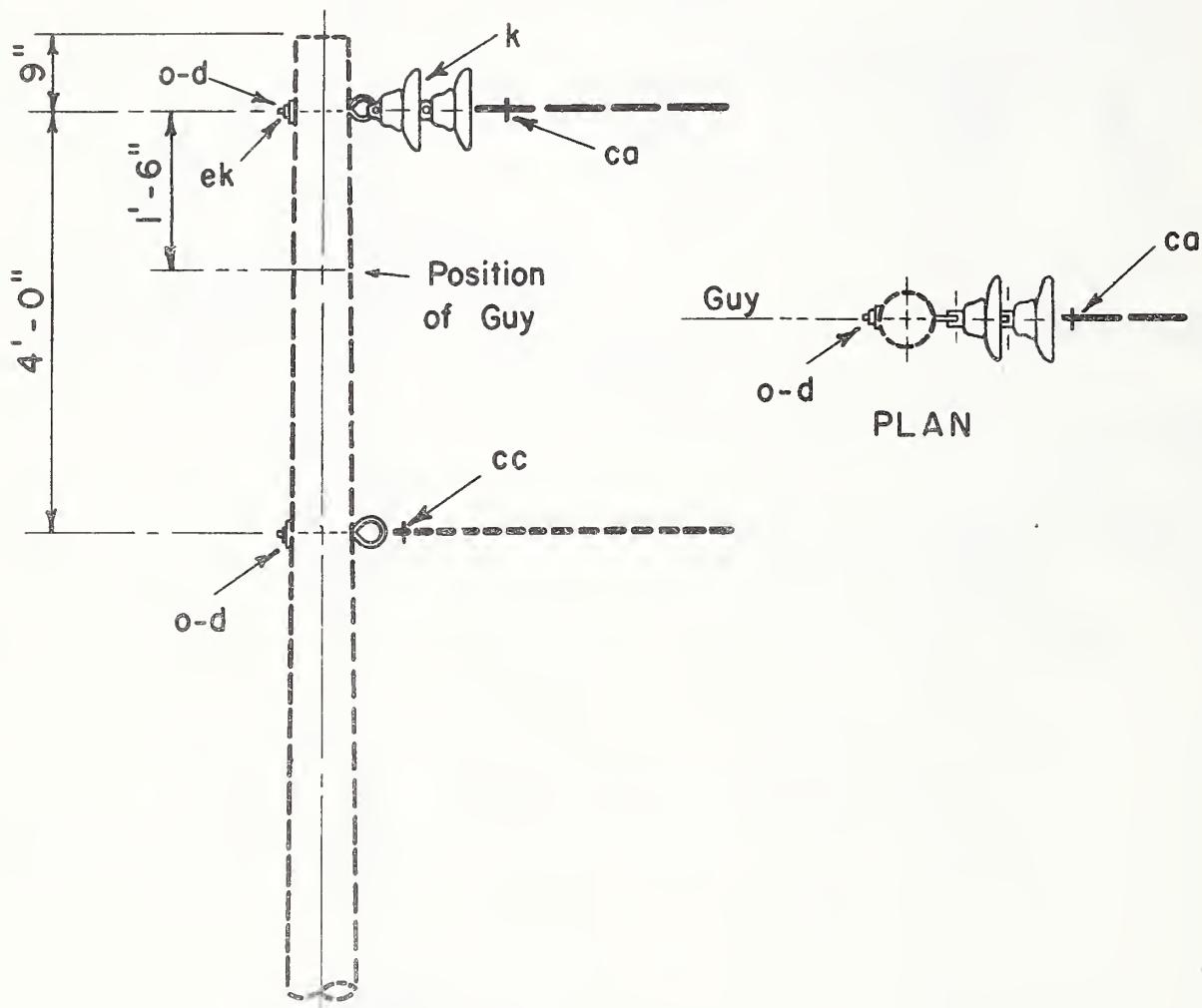


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 4	Washer, square, 2 1/4"	ca 2	Deadend assembly, primary
k 4	Insulator, suspension, 10"	cc 2	Deadend assembly, neutral
o 4	Bolt, eye, 5/8" x req'd. length	ek	Locknuts
p	Connectors, as req'd.	aq	Jumpers, as required

14.4/24.9 KV PRIMARY
1-PHASE, 60° TO 90° ANGLE

Jan. 1, 1963

VA 4

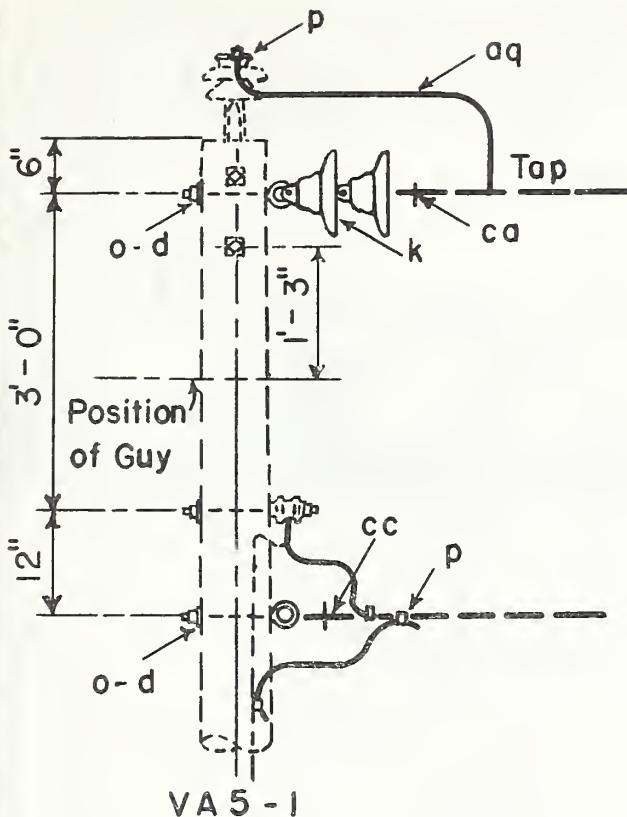


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 2	Washer, square 2 1/4"	cc 1	Deadend assembly, neutral
k 2	Insulator, suspension, 10"	ek	Locknuts
o 2	Bolt, eye, 5/8" x req'd. length		
ca 1	Deadend assembly, primary		

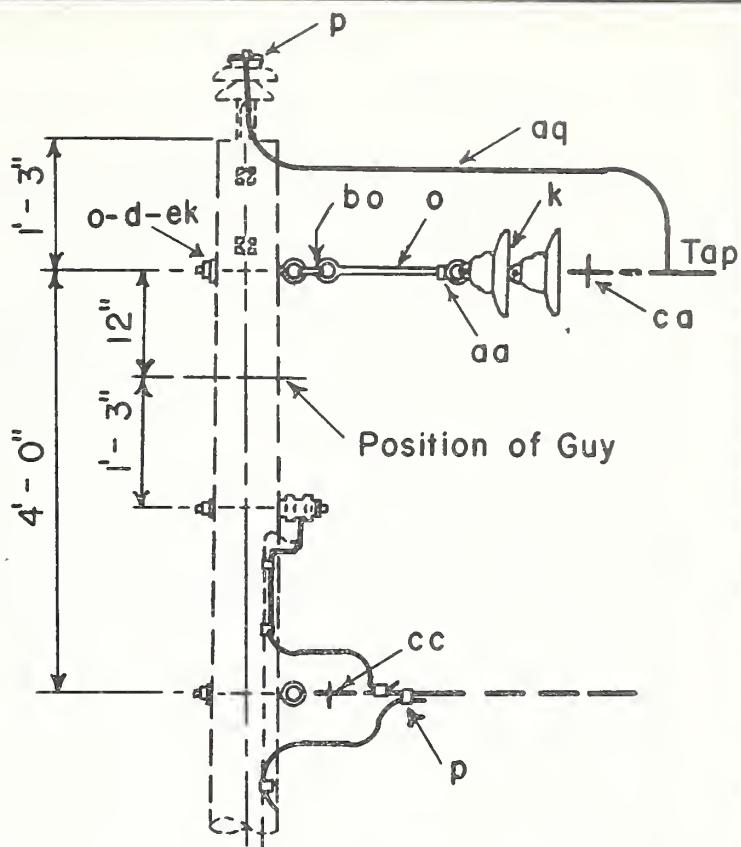
14.4/129 KV PRIMARY
I-PHASE, DEADEND (SINGLE)

Jan. 1, 1963

VA5



VA5-1

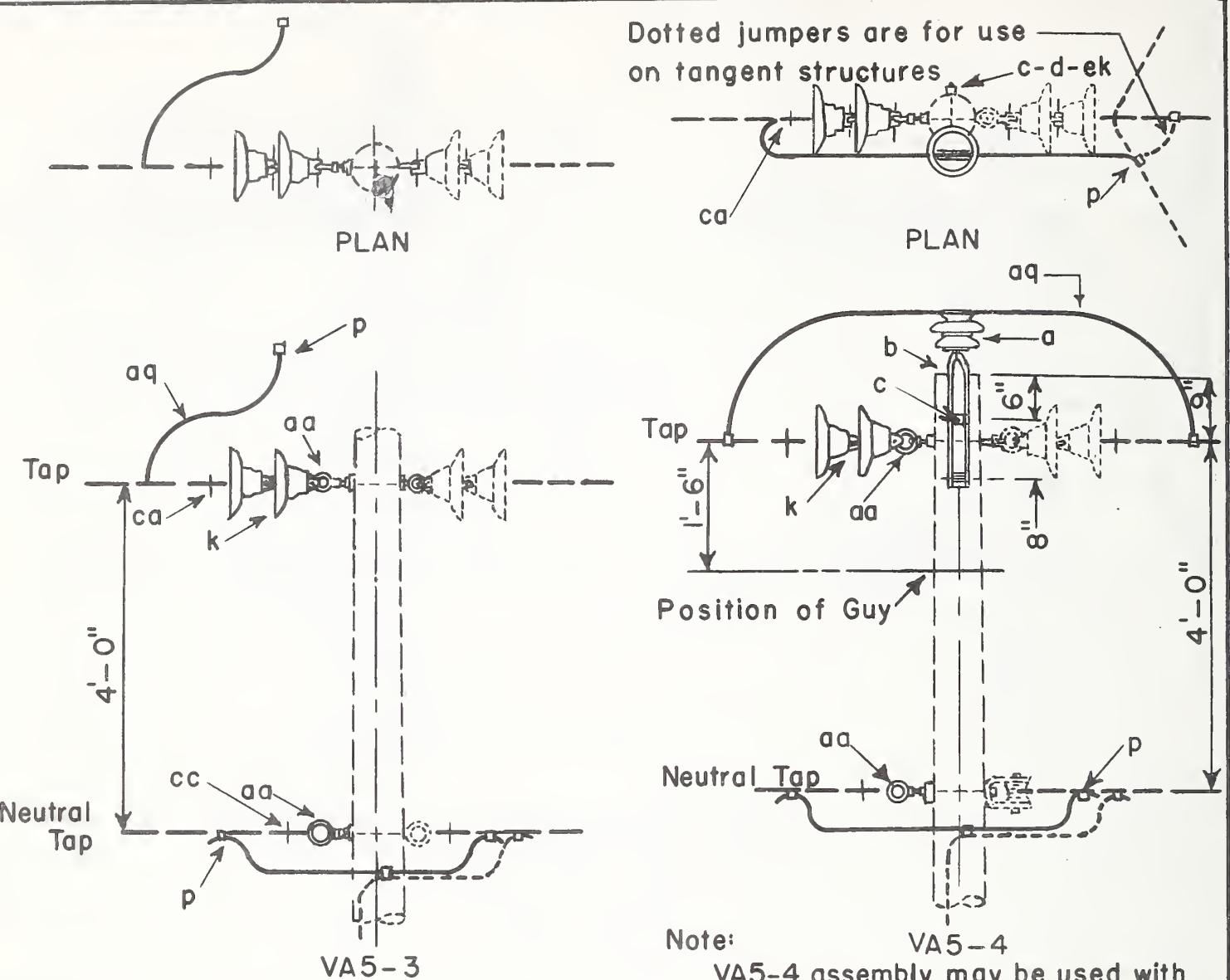


VA5-2

Notes:

1. VA5-1 and VA5-2 assemblies may be used with the following drawings: VA1, VA1-1, VA1-2, VA2 and VA2-3.
2. See drawings VM29-1 for tap assembly guide.
3. Specify VA5-2A for tap to existing eyebolt.

ITEM	MATERIAL	ASSEMBLY UNIT		
		VA5-1	VA5-2	VA5-2A
d	Washer, square, 2 1/4"	2	2	
k	Insulator, suspension, 10"	2	2	2
o	Bolt, eye, 5/8" x req'd. length	2	3	1
p	Connectors, as required			
aa	Nut, eye, 5/8"		1	3
aq	Jumpers, as required			
ca	Deadend assembly, primary	1	1	1
cc	Deadend assembly, neutral	1	1	1
bo	Shackle, anchor			
ek	Locknuts			
14.4/24.9 KV. PRIMARY SINGLE PHASE TAP				
Jan. 1, 1963		VA5-1, VA5-2, VA5-2A		



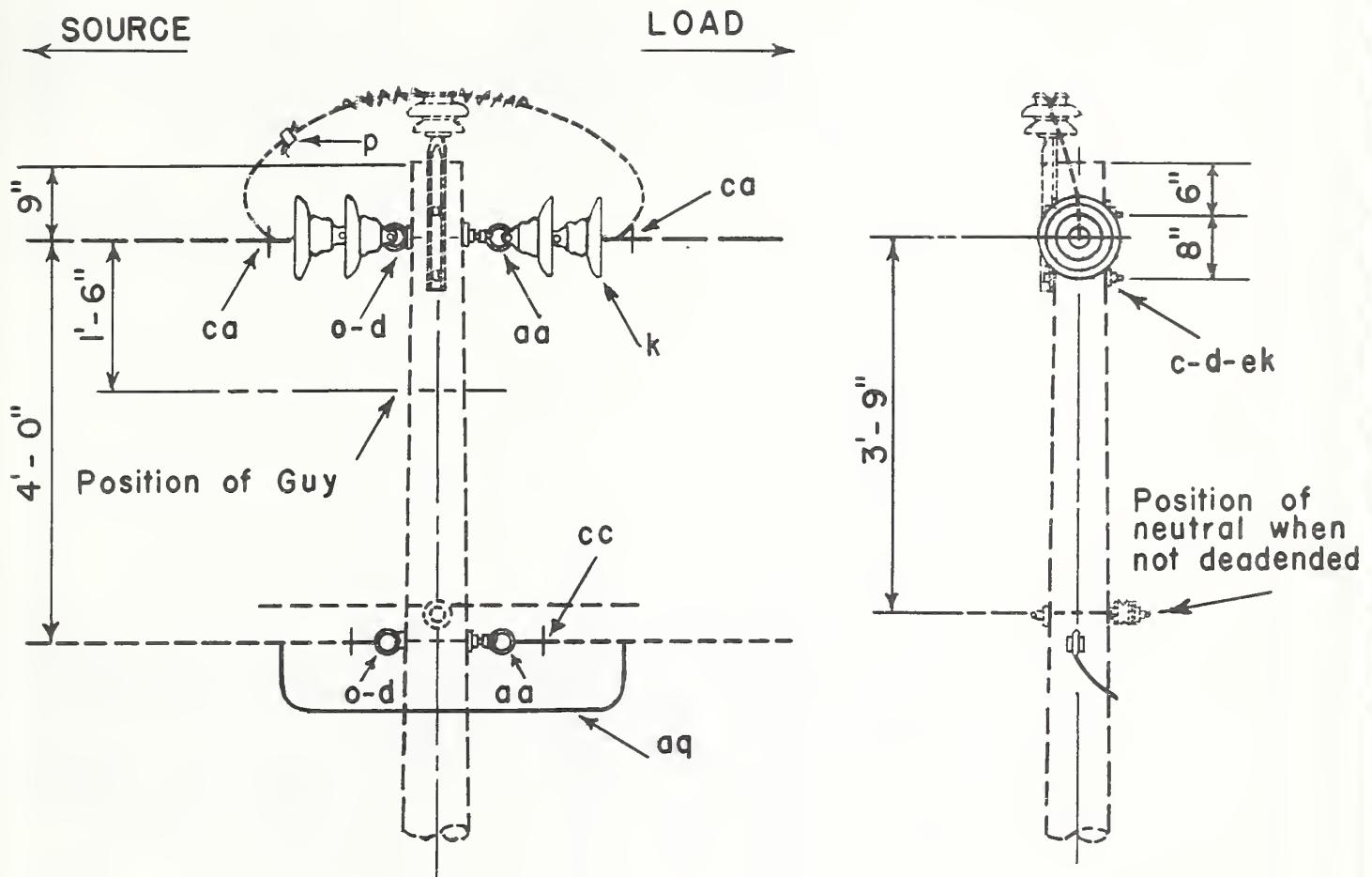
Note: VA5-3 assembly may be used with the following drawings: VA4, VA5, VB4-1, and VC4-1.

See drawing VM29-1 for tap assembly guide.

Note: VA5-4
VA5-4 assembly may be used with the following: VA3, VA5, VB3, VB5-1, VC3, and VC5-1.

ITEM	MATERIAL	ASSEMBLY UNIT	
		VA5-3	VA5-4
a	Insulator, pin type		1
b	Pin, pole top, 20"		1
c	Bolt, machine, 5/8" x required length		2
d	Washer, square, 2 1/4"		2
k	Insulator, suspension, 10"	2	2
p	Connectors, as required		
aa	Nut, eye, 5/8"	2	2
aq	Jumpers and leads, as required		
ca	Deadend assembly, primary	1	1
cc	Deadend assembly, neutral	1	1
ek	Locknuts		

14.4/24.9 KV. PRIMARY
SINGLE PHASE TAP

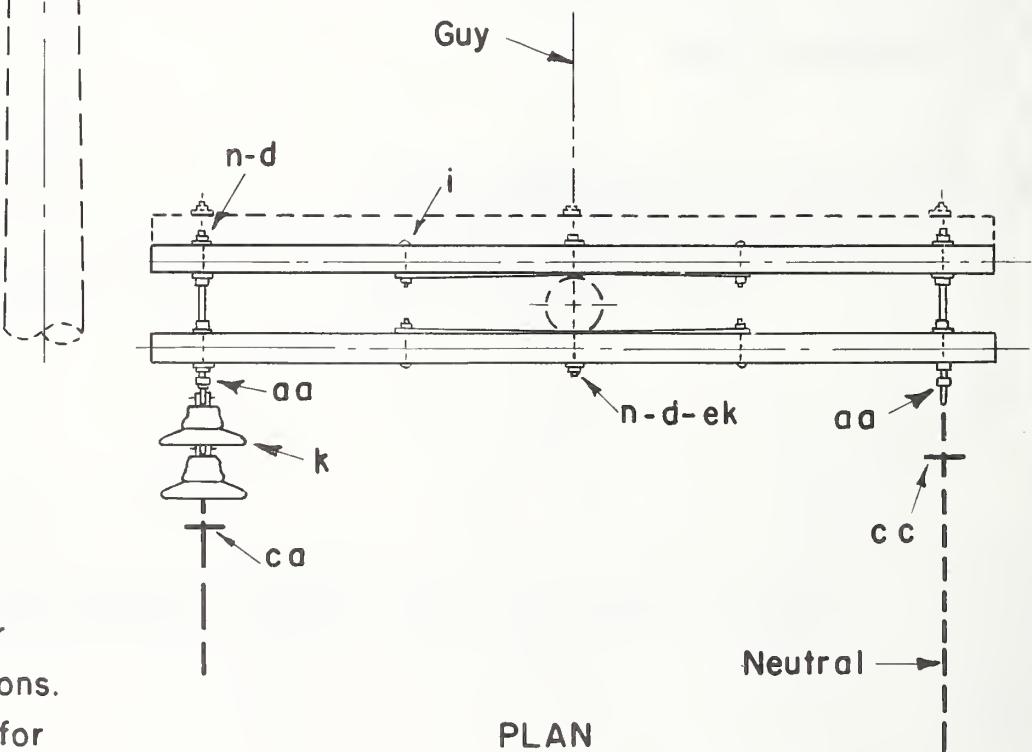
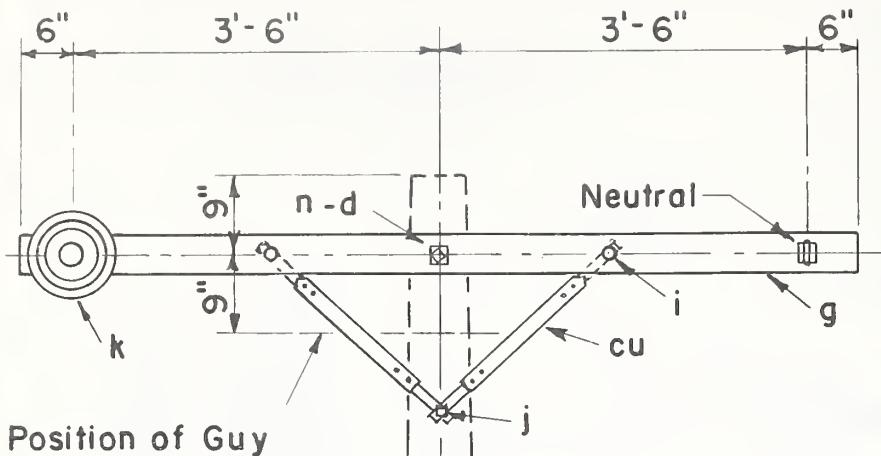


Note:

VA6 may be used with drawings such as VM3-1, VM3-1A, VM3-10, VM3-23, VM5-1, VM5-4, VM5-2 (as shown).

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 4	Washer, square, 2 1/4"	aa 2	Nut, eye, 5/8"
k 4	Insulator, suspension, 10"	aq	Jumpers, as required
o 2	Bolt, eye, 5/8" x required length	ca 2	Deadend assembly, primary
p	Connectors, as required	cc 2	Deadend assembly, neutral
		ek	Locknuts

14.4/24.9 KV PRIMARY, 1-PHASE,
VERTICAL DEADEND (DOUBLE)



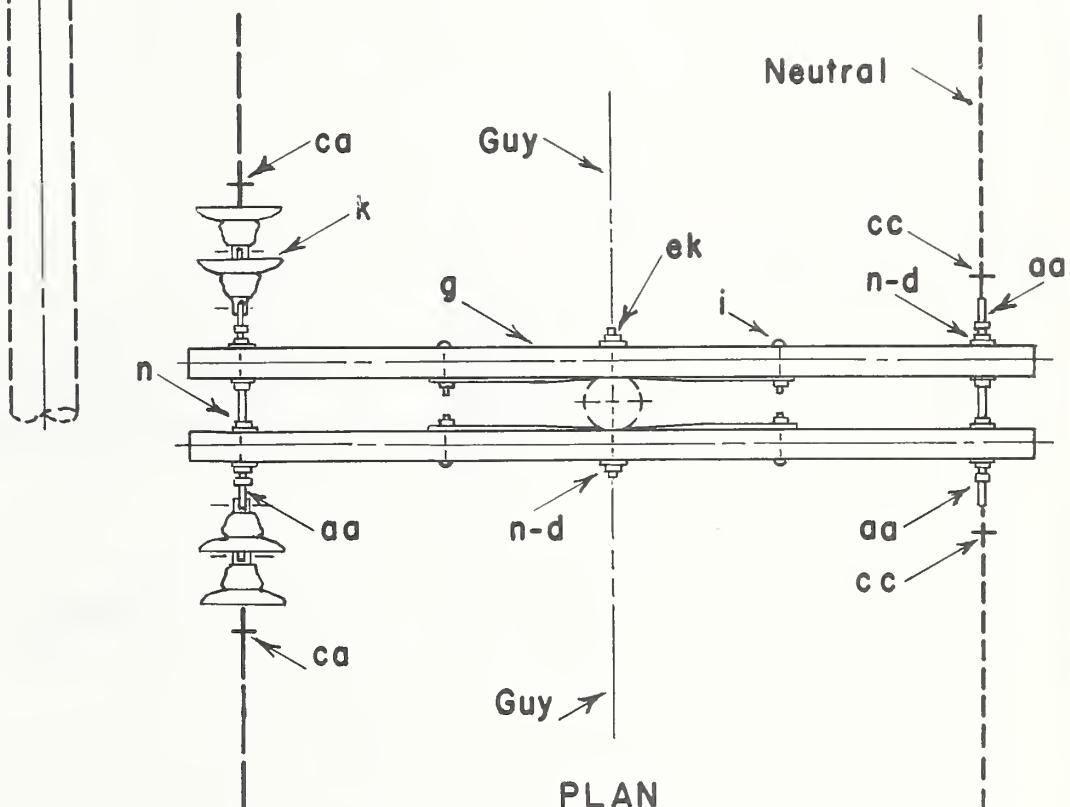
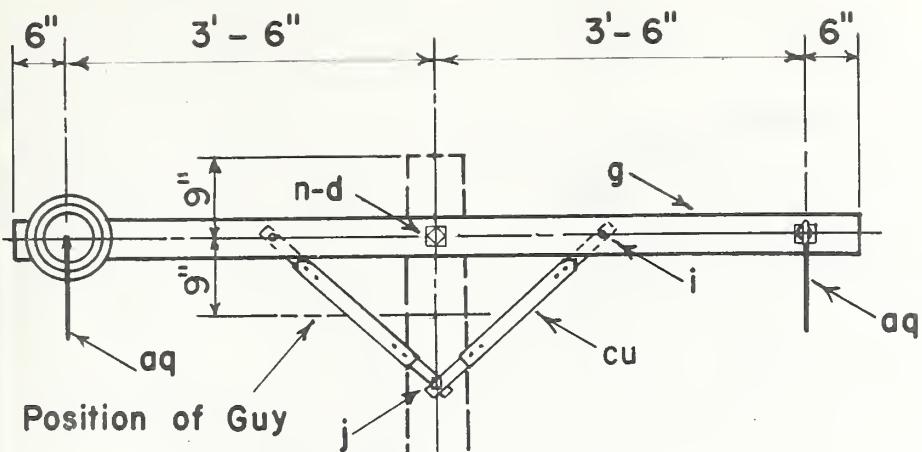
Notes:

1. See drawing E5-1 for crossarm loading limitations.
2. Designate as VA7-1 for assembly with three crossarms.

PLAN

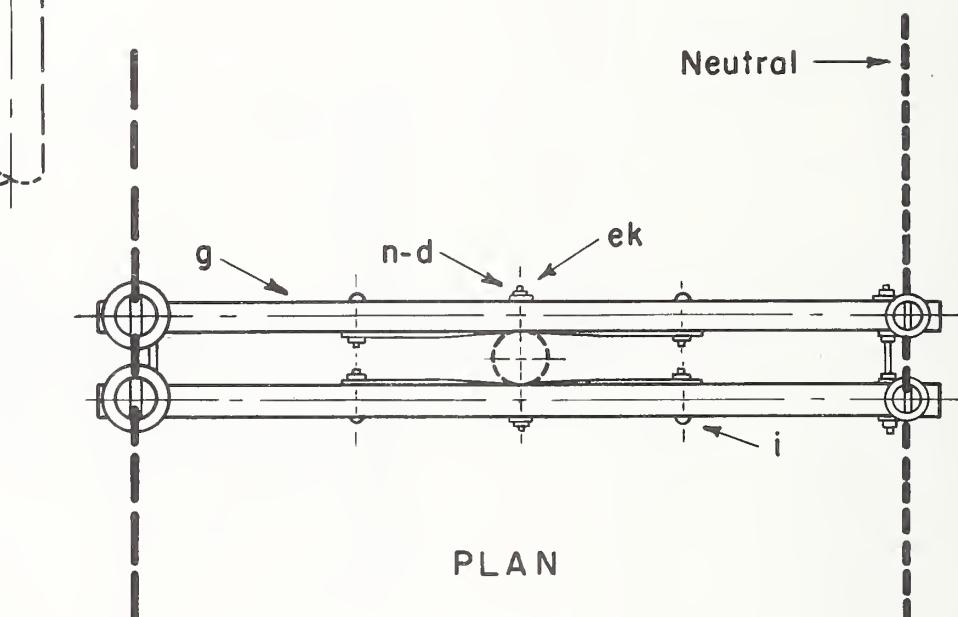
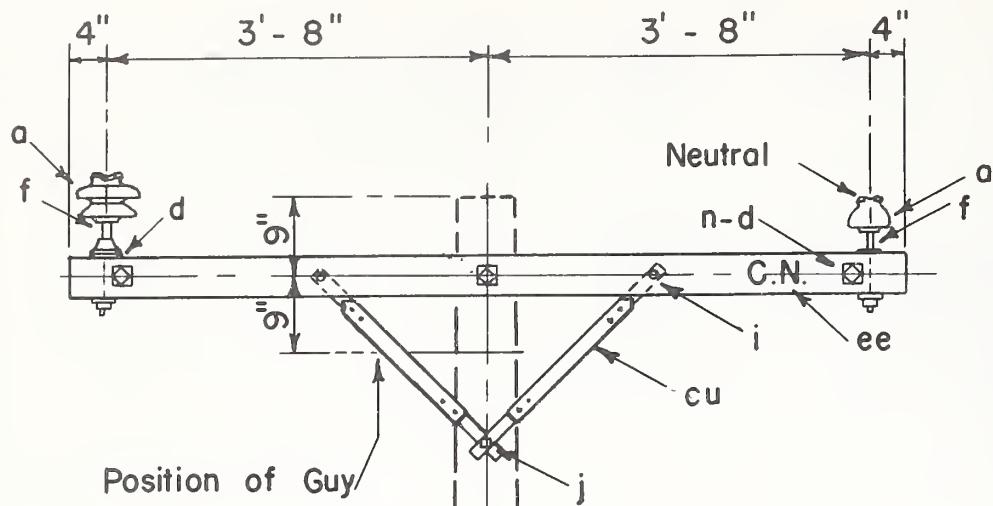
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 10	Washer, square, 2 1/4"	k 2	Insulator, suspension, 10"
g 2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	n 3	Bolt, double arming, 5/8" x req'd length
cu 4	Brace, wood, 28"	aa 2	Nut, eye, 5/8"
i 4	Bolt, carriage, 3/8" x 4 1/4"	ca 1	Deadend assembly, primary
j 2	Screw, lag, 1/2" x 4"	cc 1	Deadend assembly, neutral
		ek	Locknuts

**14.4/24.9 KV. PRIMARY, I-PHASE
CROSSARM CONSTR.-DEADEND (SINGLE)**



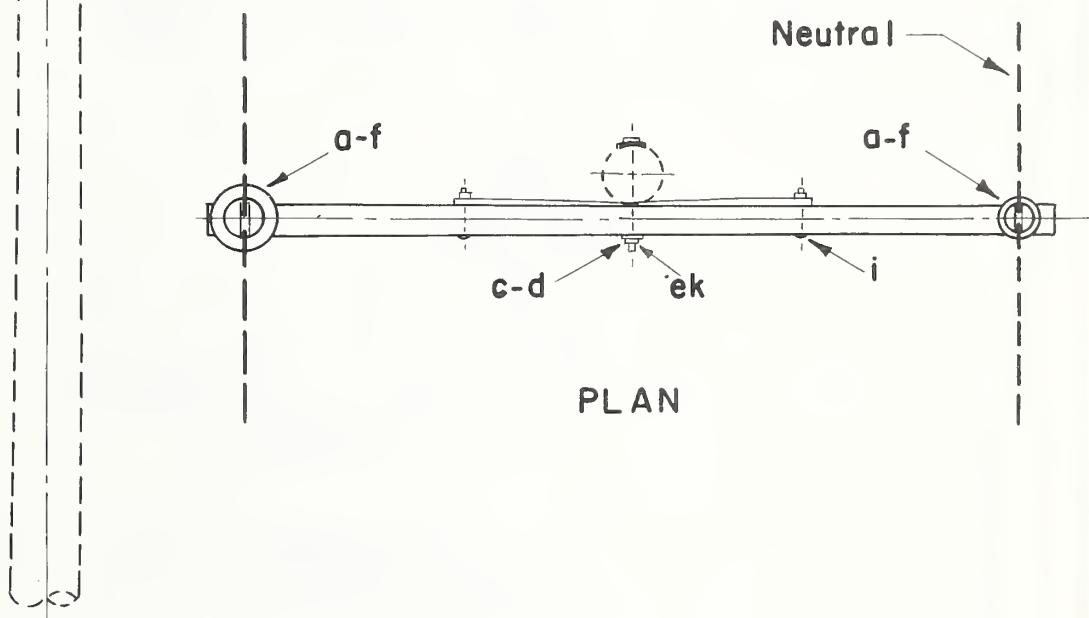
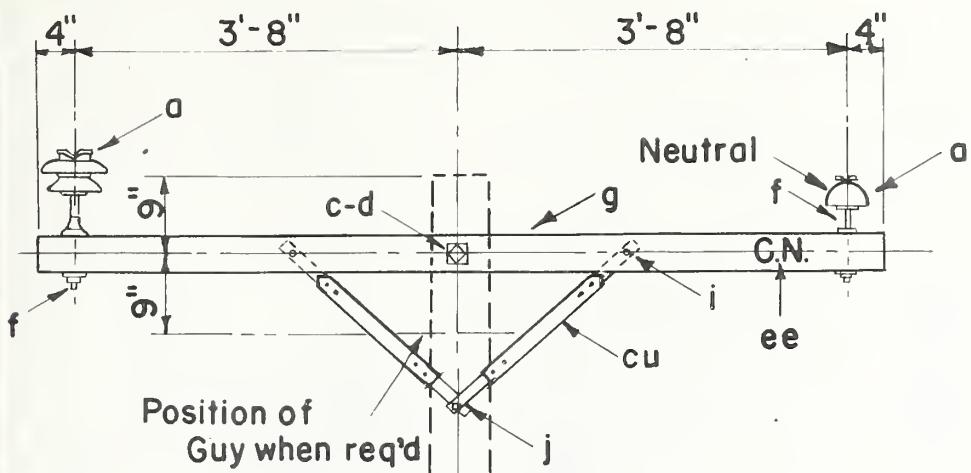
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	10	Washer, square, 2 1/4"	p		Connectors, as required
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	aa	4	Nut, eye, 5/8"
cu	4	Brace, wood, 28"	aq		Jumpers, as required
i	4	Bolt, carriage, 3/8" x 4 1/2"	ca	2	Deadend assembly, primary
j	2	Screw, lag, 1/2" x 4"	cc	2	Deadend assembly, neutral
k	4	Insulator, suspension, 10"	ek	2	Locknuts
n	3	Bolt, double arming, 5/8" x req'd. length			

14.4/24.9 KV. PRIMARY, 1-PHASE
CROSSARM CONSTRUCTION – DEADEND (DOUBLE)



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	2	Insulator, pin type	i	4	Bolt, carriage, 3/8" x 4 1/2"
ee	4	Letters, 2 "C", 2 "N", with 1" nails	j	2	Screw, lag, 1/2" x 4"
d	10	Washer, square, 2 1/4"	n	3	Bolt, double arming, 5/8" x req'd. length
f	2	Pin, crossarm, steel, 5/8" x 14"	f	2	Pin, crossarm, steel, 5/8" x 10 3/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	d	2	Washer, square, 3"
cu	4	Brace, wood, 28"	ek		Locknuts
a	2	Insulator, pin type, (7.2 / 12.5 KV)			

14.4/24.9 KV, I-PHASE
CROSSARM CONSTRUCTION-DOUBLE LINE ARM



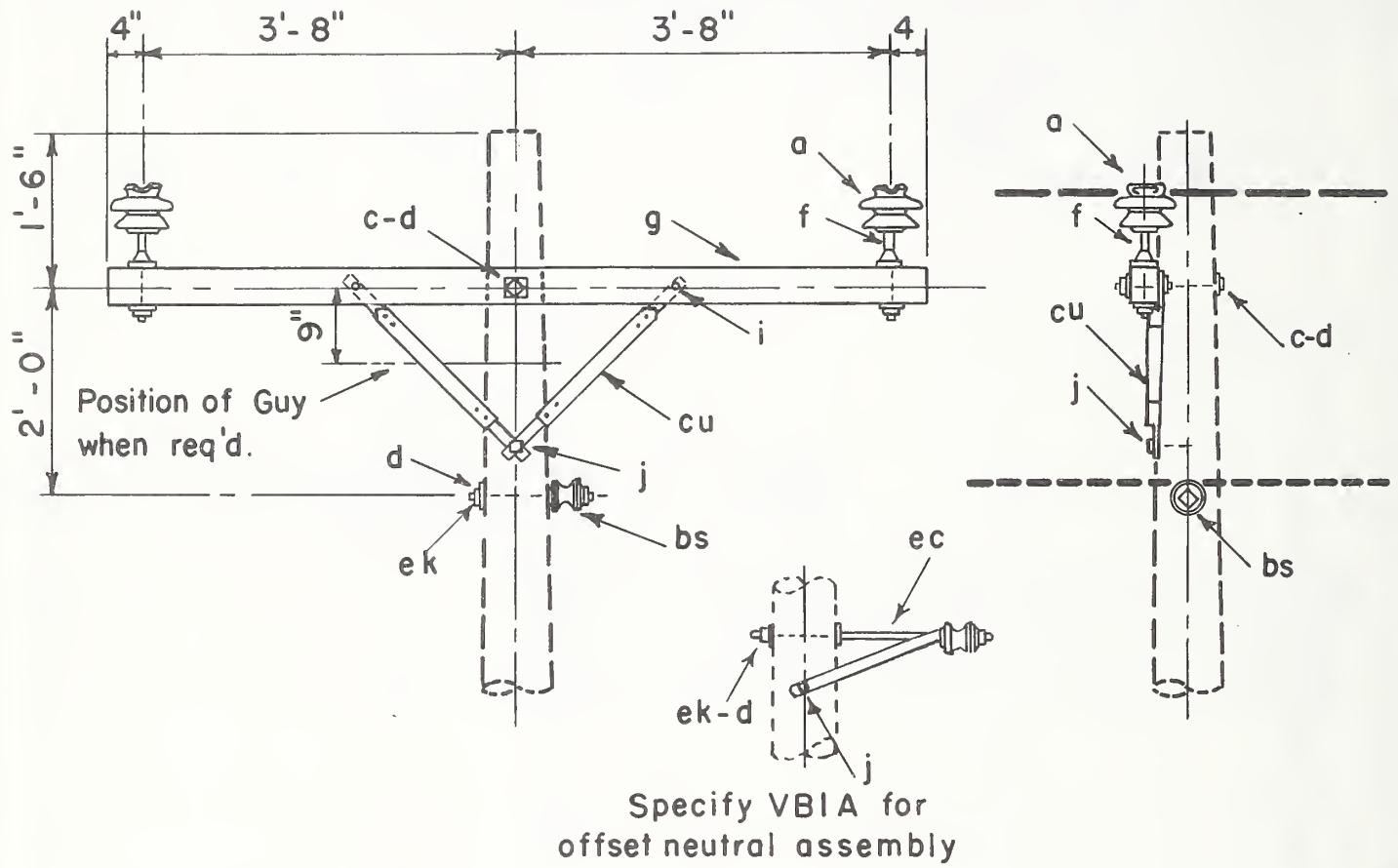
PLAN

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a	1 Insulator, pin type	cu	2 Brace, wood, 28"
c	1 Bolt, machine, $\frac{5}{8}$ " x reqd length	i	2 Bolt, carriage, $\frac{3}{8}$ " x 4½"
d	2 Washer, square; 2 1/4"	j	1 Screw, lag, ½" x 4"
f	1 Pin, crossarm, steel, $\frac{5}{8}$ " x 14"	ee	4 Letters, 2 "C", 2 "N", with 1" nails
f	1 Pin, crossarm, steel, $\frac{5}{8}$ " x 10 ¾"	ek	Locknuts
g	1 Crossarm, 3 ½" x 4 ½" x 8'-0"	a	1 Insulator, pin type , (7.2/12.5 KV)

14.4/24.9 KV, I-PHASE
CROSSARM CONSTRUCTION-SINGLE LINE ARM

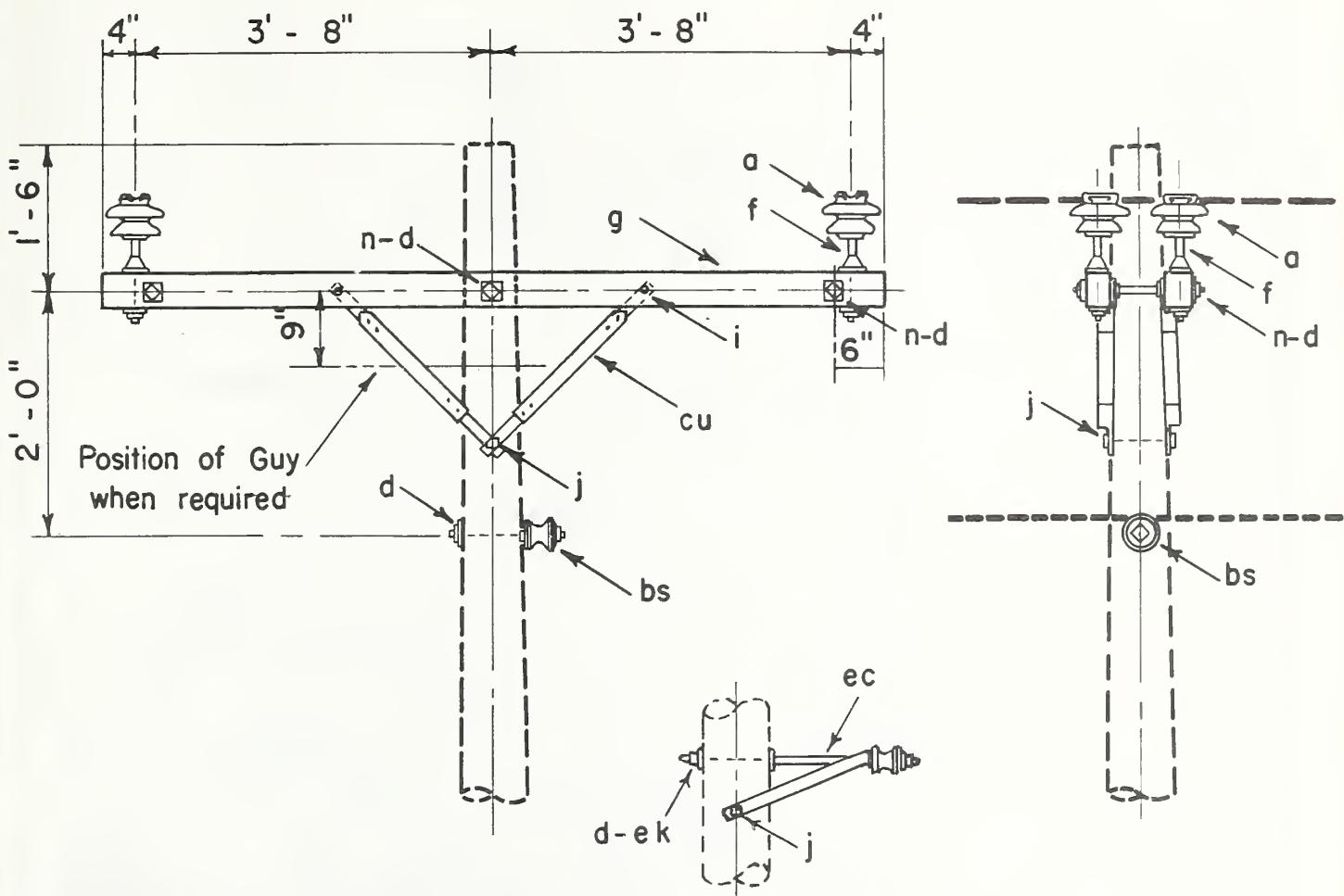
Jan. 1, 1963

VA9-1



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 2	Insulator, pin type	cu 2	Brace, wood, 28"
c 1	Bolt, machine, 5/8" x req'd. length	i 2	Bolt, carriage, 3/8" x 4 1/2"
d 3	Washer, square 2 1/4"	j 1	Screw, lag, 1/2" x 4" (VBI only)
f 2	Pin, crossarm, steel, 5/8" x 14"	bs 1	Bolt, single upset, insulated (VBI only)
g 1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	ec 1	Bracket, offset, neutral (VBIA only)
j 3	Screw, lag, 1/2" x 4" (VBIA only)		
ek	Locknuts		

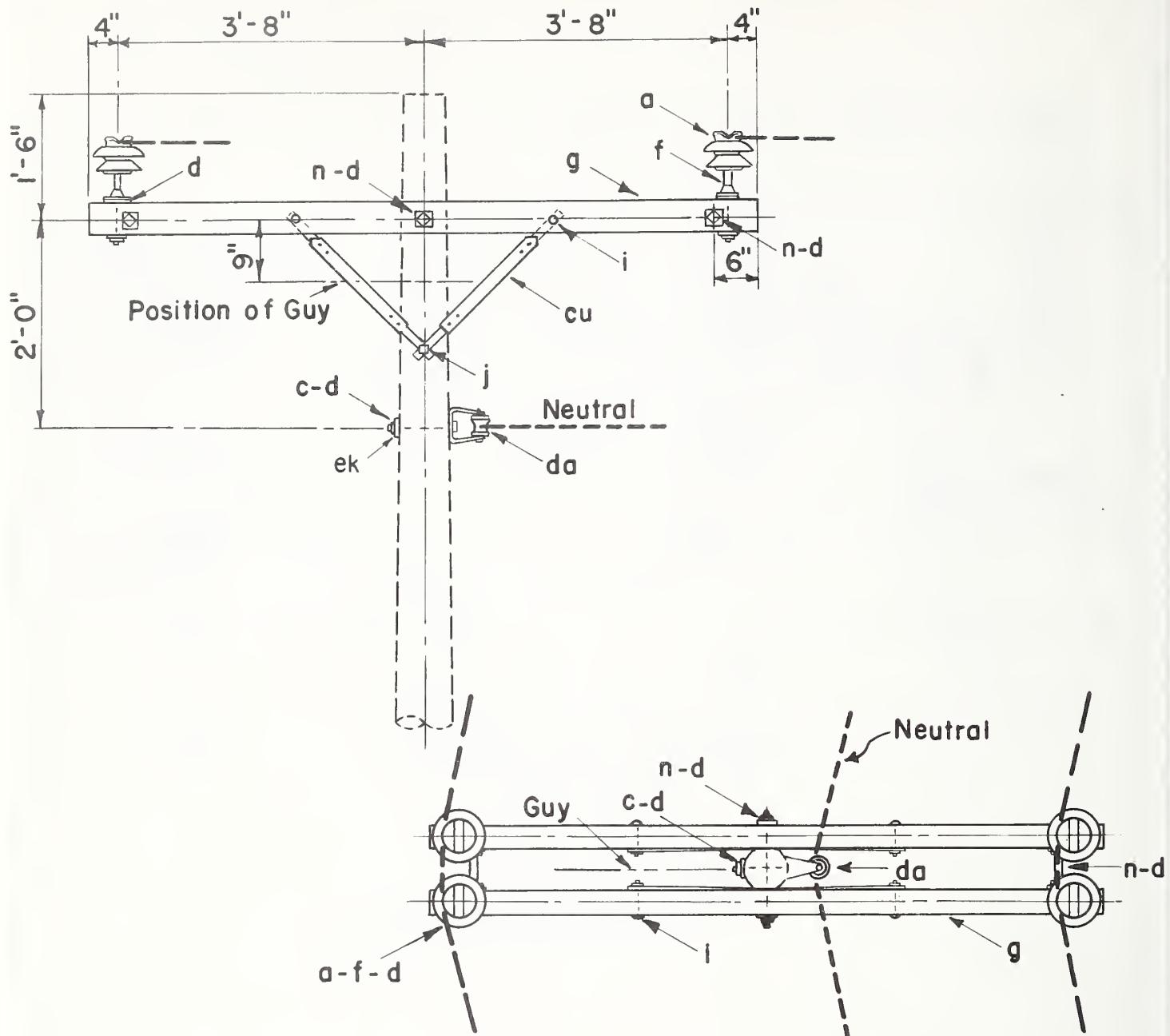
14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION, 0° TO 5° ANGLE
SINGLE PRIMARY SUPPORT



Specify VBI-IA for
offset neutral assembly

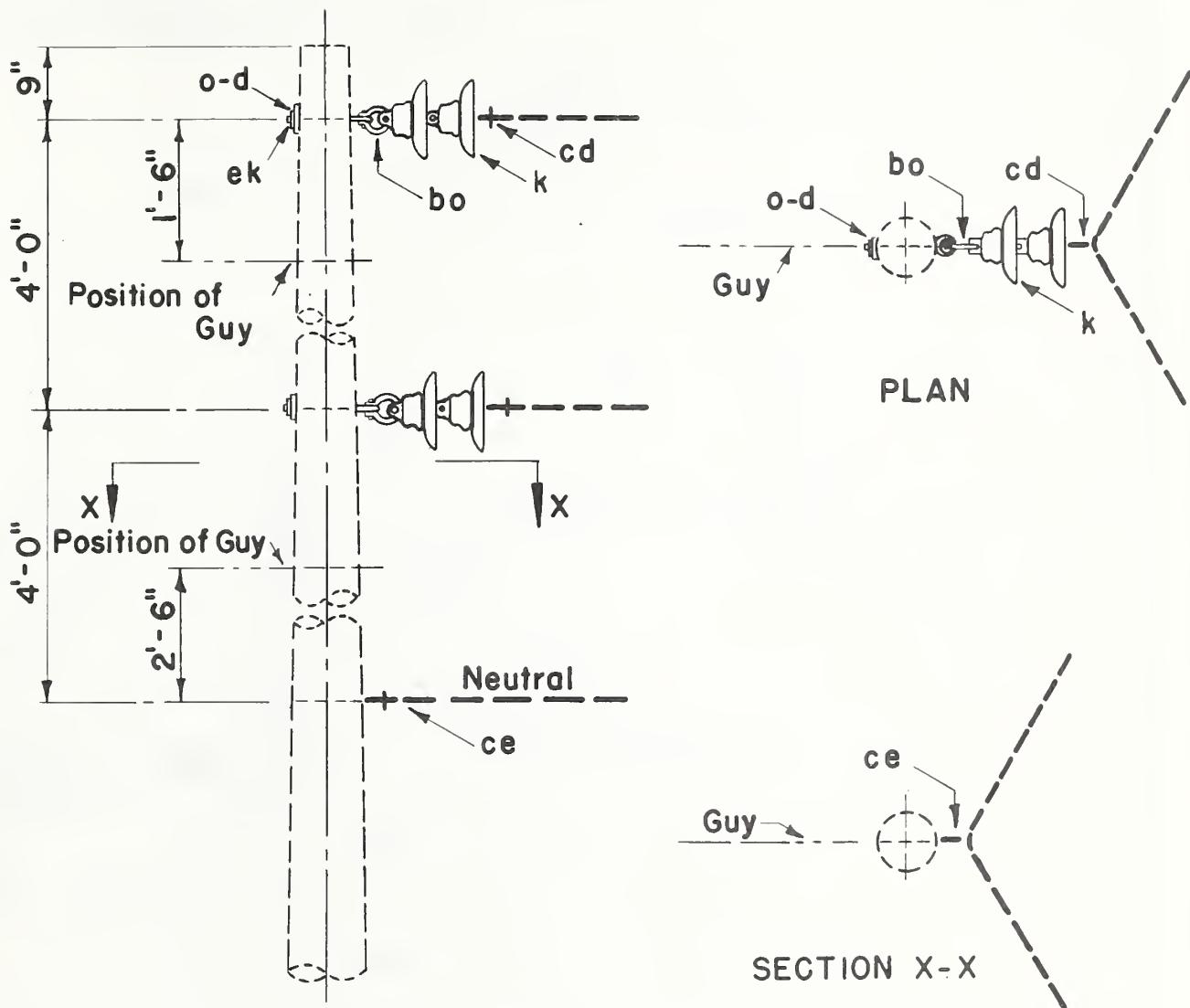
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	4	Insulator, pin type	i	4	Bolt, carriage, 3/8" x 4 1/2"
ek		Locknuts	j	2	Screw, lag, 1/2" x 4", (VBI-I only)
d	11	Washer, square 2 1/4"	n	3	Bolt, double arming, 5/8" x reqd. length
f	4	Pin, crossarm, steel, 5/8" x 14"	bs	1	Bolt, single upset, insulated, (VBI-I only)
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	ec	i	Bracket, offset, insulated, (VBI-IA only)
cu	4	Brace, wood, 28"	j	4	Screw, lag, 1/2" x 4", (VBI-IA only)

14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION, 0° TO 5° ANGLE
DOUBLE PRIMARY SUPPORT



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a	4 Insulator, pin type	cu	4 Brace, wood, 28"
c	1 Bolt, machine, $\frac{5}{8}$ " x reqd length	i	4 Bolt, carriage, $\frac{3}{8}$ " x 4 $\frac{1}{2}$ "
d	11 Washer, square 2 1/4"	j	2 Screw, lag, $\frac{1}{2}$ " x 4"
d	4 Washer, 3" x 3" x 1/4", $\frac{13}{16}$ " hole	n	3 Bolt, double arming, $\frac{5}{8}$ " x req'd length
f	4 Pin, crossarm, steel, $\frac{5}{8}$ " x 14"	da	1 Bracket, insulated
g	2 Crossarm, 3 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ " x 8'-0"	ek	Locknuts

14.4/24.9 KV. TWO PHASE
CROSSARM CONSTR.- DOUBLE PRIMARY SUPPORT
MAX. TRANSVERSE LOADING 750 LBS./PIN
(5° TO 30° MAX. ANGLE)

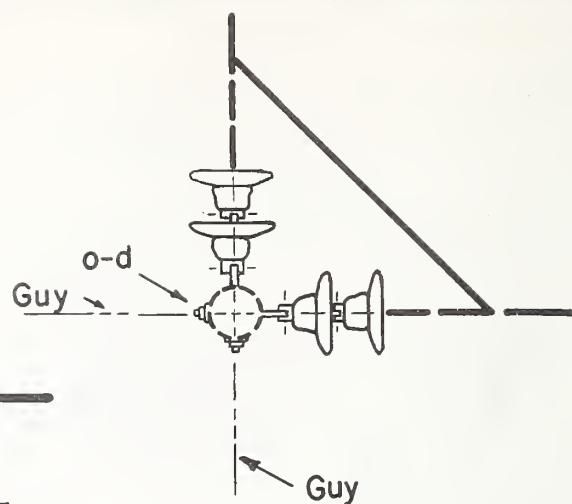
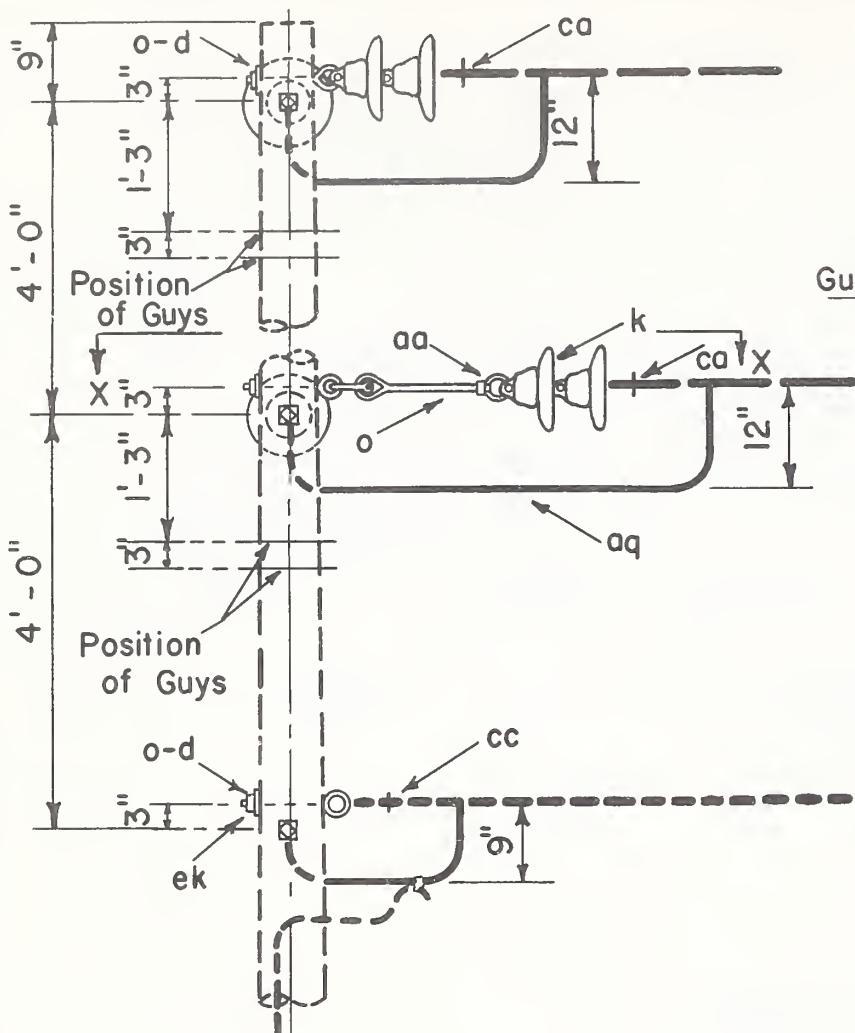


Note:

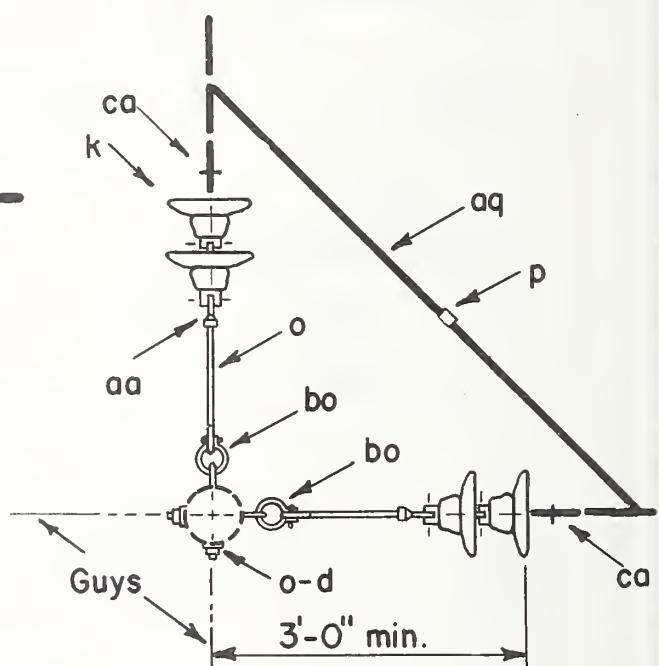
If future conversion is likely, allow space at top of pole for middle phase. Designate as VB3A for this construction.

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 2	Washer, 2 1/4" square	ce 1	Angle assembly, neutral
k 4	Insulator, suspension, 10"	ek	Locknuts
o 2	Bolt, eye, 5/8" x req'd length		
bo 2	Shackle, anchor		
cd 2	Angle assembly, primary		

14.4/24.9 KV., TWO PHASE
VERTICAL CONSTRUCTION - 30° TO 60° ANGLE



PLAN



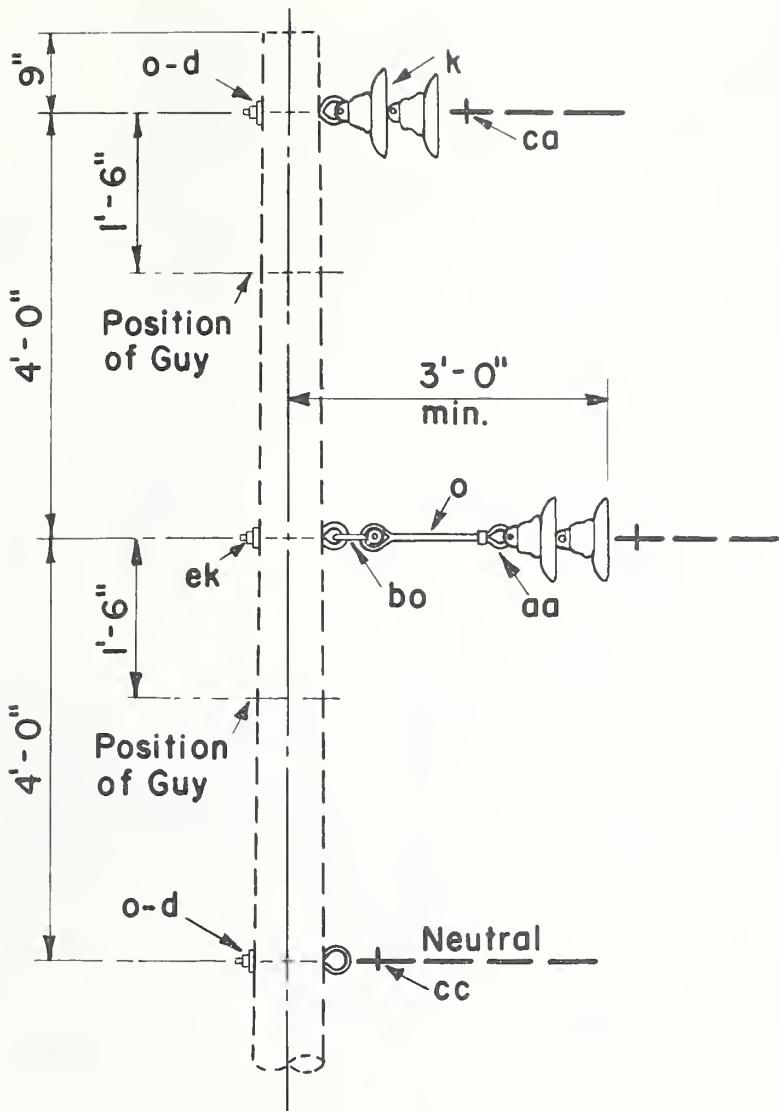
SECTION X-X

Note:

If future conversion is likely, allow space at top of pole for middle phase. Designate as VB4-1A for this construction.

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 6	Washer, 2 1/4" square	bo 2	Shackle, anchor
k 8	Insulator, suspension, 10"	ca 4	Deadend assembly, primary
o 8	Bolt, eye, 5/8" x req'd. length	cc 2	Deadend assembly, neutral
p	Connectors, as required	ek	Locknuts
aa 2	Nut, eye, 5/8"		
aq	Jumpers, as required		

14.4/24.9 KV, TWO PHASE
VERTICAL CONSTRUCTION-60° TO 90° ANGLE

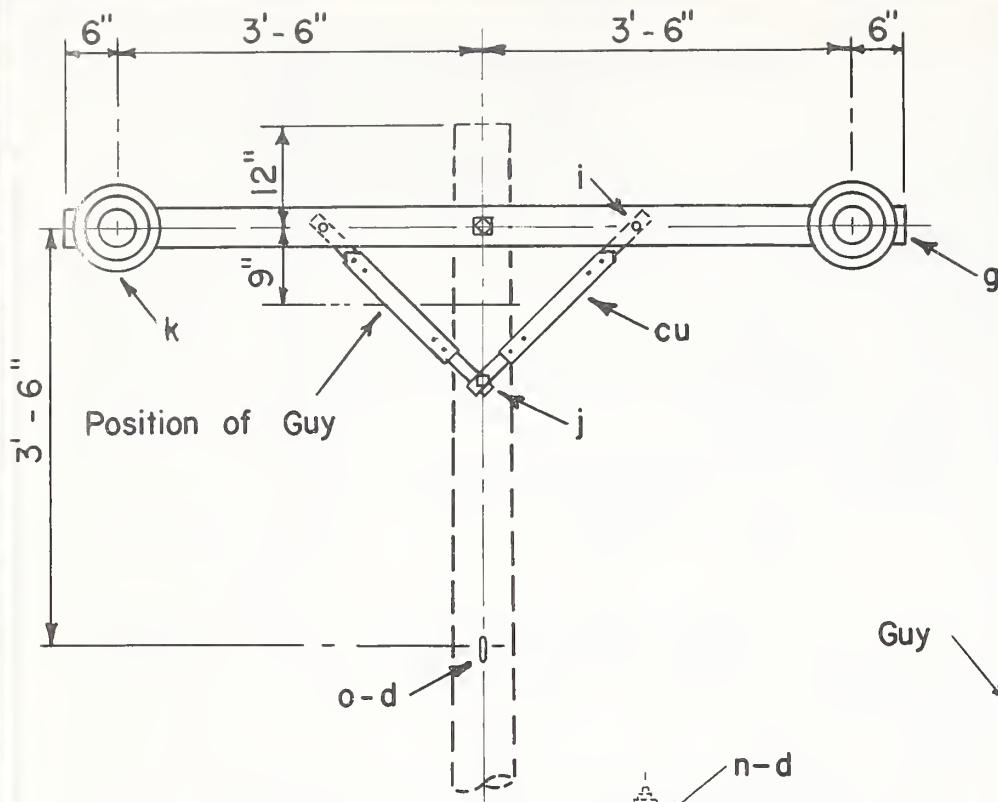


Note:

If future conversion to three phase is likely, allow space at top of pole for middle phase.
Designate as VB 5-1A for this construction.

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 3	Washer, square, 2 1/4"	ca 2	Deadend assembly, primary
k 4	Insulator, suspension, 10"	cc 1	Deadend assembly, neutral
o 4	Bolt, eye, 5/8" x req'd length	bo 1	Shackle, anchor
aa 1	Nut, eye, 5/8"	ek	Locknuts

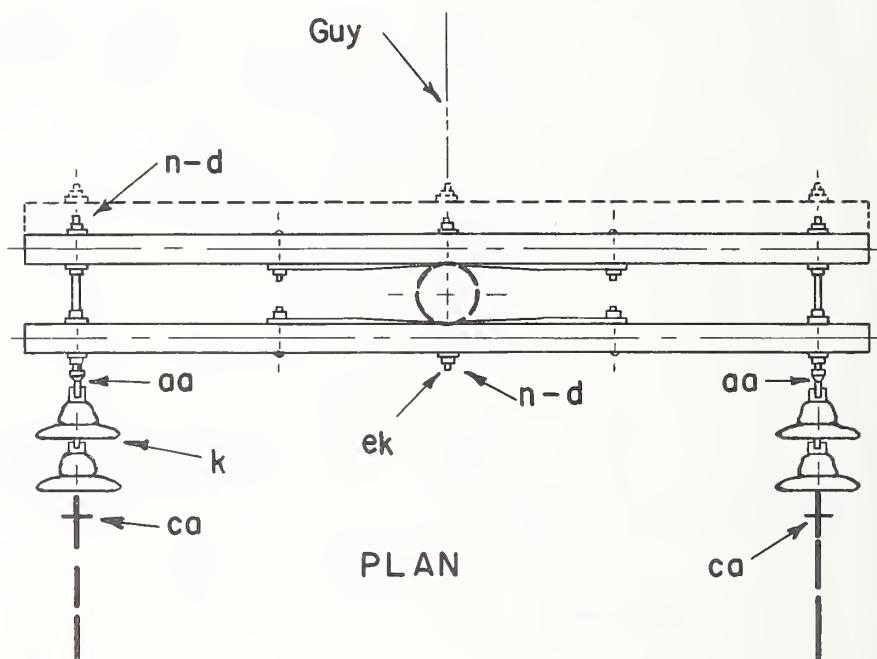
14.4/24.9 KV., TWO PHASE
VERTICAL CONSTRUCTION-DEADEND(SINGLE)



Notes:

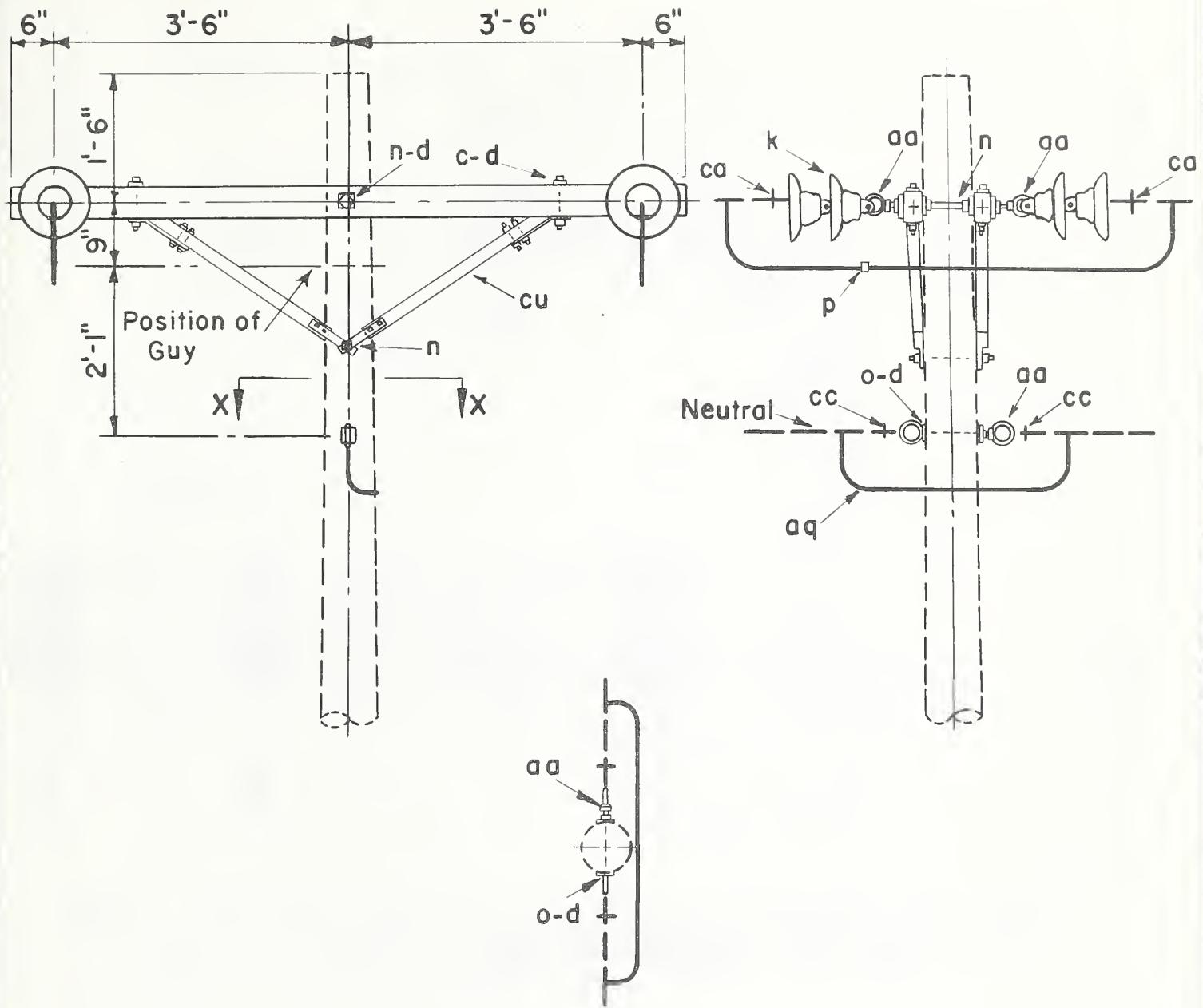
1. See drawing VE5-1 for crossarm loading limitations.

2. Designate as VB7-1 for assembly with three crossarms.



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	11	Washer, square, 2 1/4"	n	3	Bolt, double arming, 5/8" x req'd. length
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	o	1	Bolt, eye, 5/8" x req'd. length
cu	4	Brace, wood, 28"	aa	2	Nut, eye, 5/8"
i	4	Bolt, carriage, 3/8" x 4 1/2"	ca	2	Deadend assembly, primary
j	2	Screw, lag, 1/2" x 4	cc	1	Deadend assembly, neutral
k	4	Insulator, suspension, 10"	ek		Locknuts

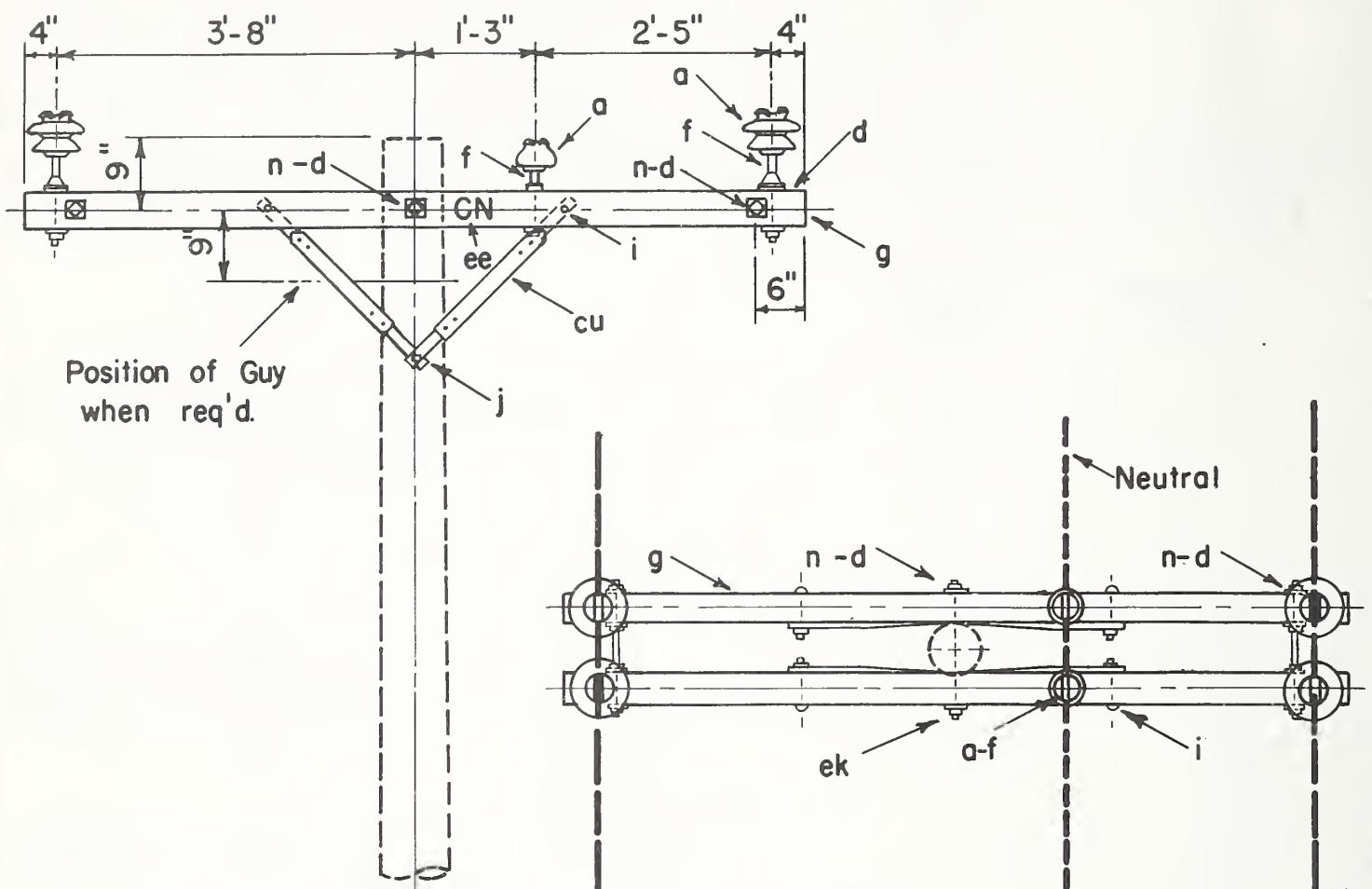
14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION-DEADEND(SINGLE)



SECTION X-X

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 4	Bolt, machine, $\frac{1}{2}$ " x req'd length	aq	Jumpers, as required
d 12	Washer, square $2\frac{1}{4}$ "	ca 4	Deadend assembly, primary
g 2	Crossarm, $3\frac{1}{2}$ " x $4\frac{1}{2}$ " x 8'-0"	cc 2	Deadend assembly, neutral
k 8	Insulator, suspension, 10"	cu 2	Brace, wood, 60" span
n 4	Bolt, double arming, $\frac{5}{8}$ " x req'd length	ek	Locknuts
o 1	Bolt, eye, $\frac{5}{8}$ " x req'd length	d 4	Washer, round, 1 3/8" dia.
p	Connectors, as required		
aa 5	Nut, eye, $\frac{5}{8}$ "		

14.4/24.9 KV., TWO PHASE
CROSSARM CONSTRUCTION - DEADEND (DOUBLE)

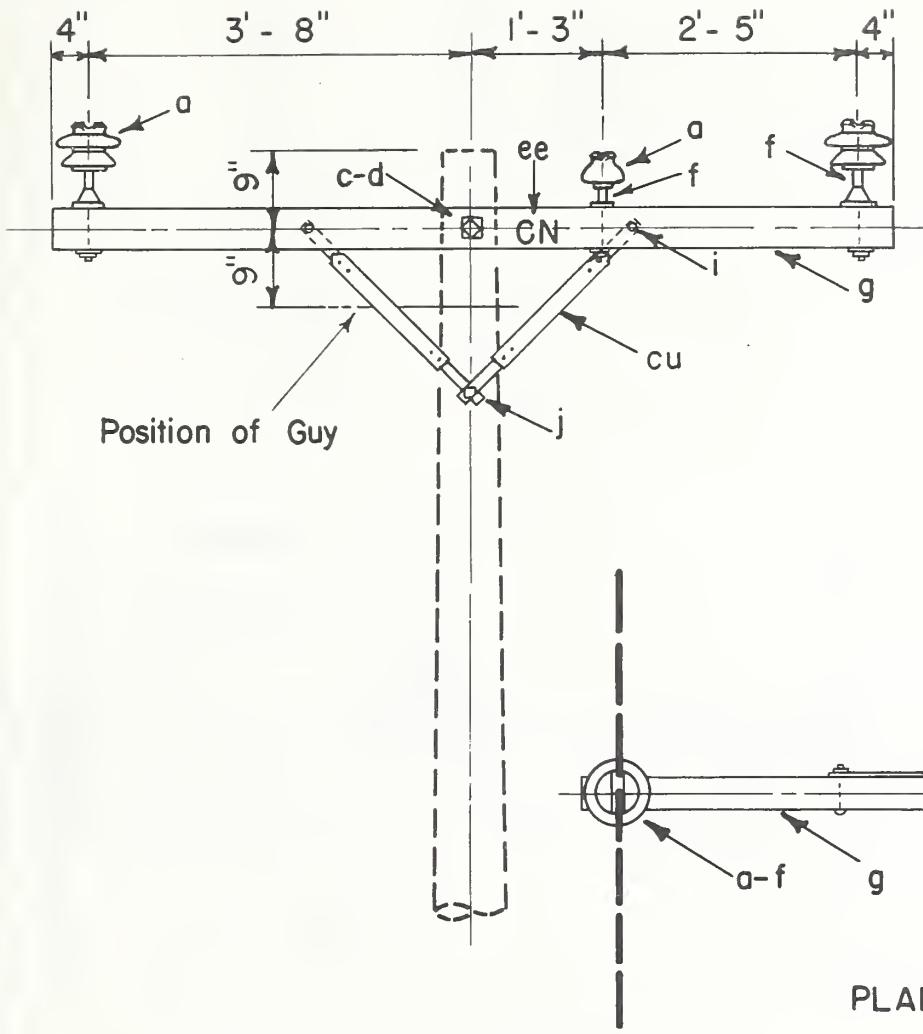


Note :

Where future conversion to three phase is likely, use construction similar to VC9 and designate as VB9-2.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	2	Insulator, pin type, (7.2 / 12.5 KV)	g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
a	4	Insulator, pin type	cu	4	Brace, wood, 28"
d	10	Washer, square 2 1/4"	i	4	Bolt, carriage, 3/8" x 4 1/2"
d	4	Washer, square 3"	j	2	Screw, lag, 1/2" x 4"
f	4	Pin, crossarm, steel, 5/8" x 14"	n	3	Bolt, double arming, 5/8" x req'd. length
f	2	Pin, crossarm, steel, 5/8" x 10 3/4"	ee	4	Letters, 2"C", 2"N", with 1" nails
			ek		Locknuts

14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION-DOUBLE LINE ARM

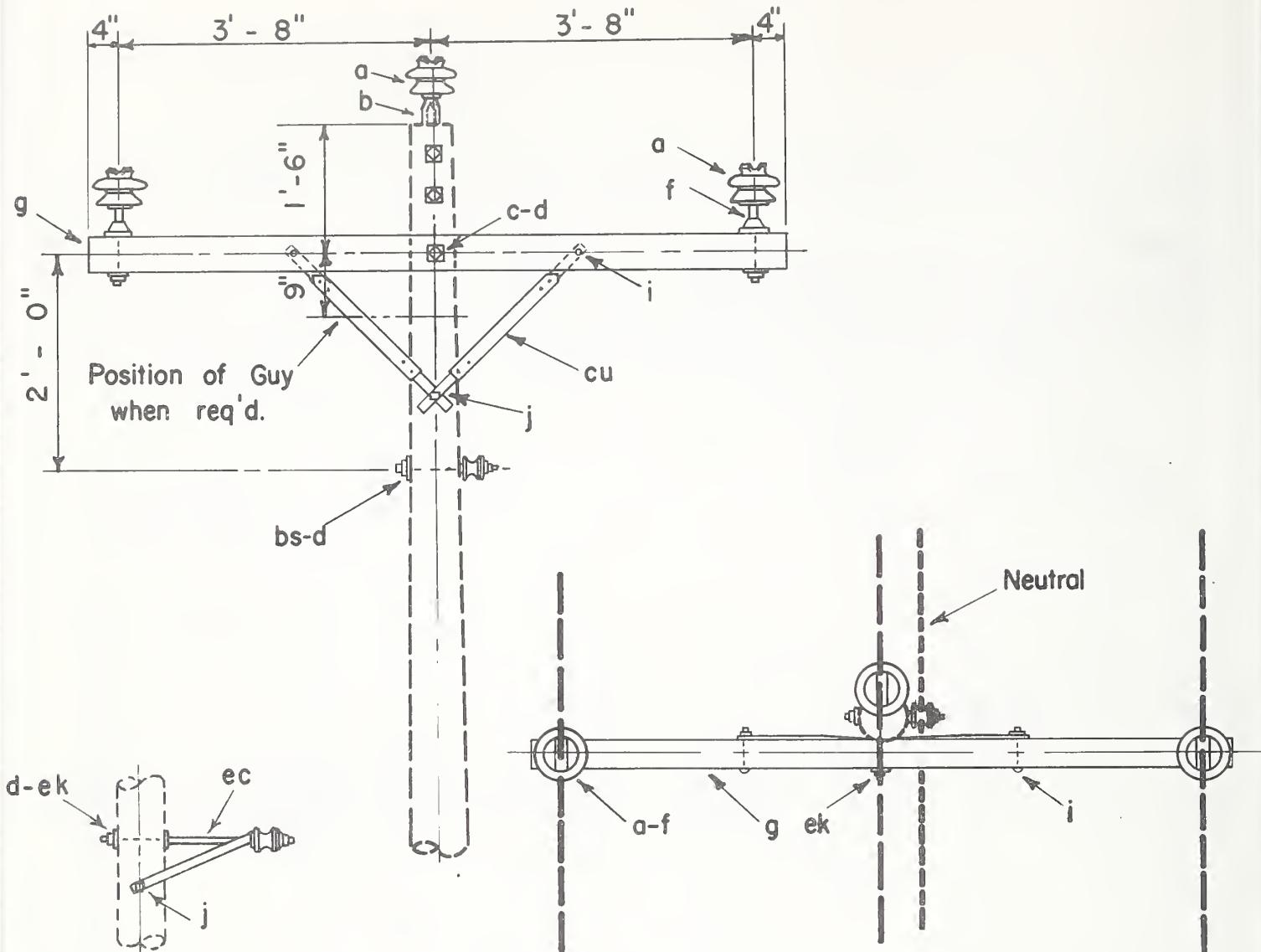


Note :

Where future conversion to three phase is likely, use construction similar to VC9-1 and designate as VB9-3

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	1	Insulator, pin type, (7.2 / 12.5 KV)	g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
a	2	Insulator, pin type	cu	2	Brace, wood, 28"
c	1	Bolt, machine, 5/8" x req'd. length	i	2	Bolt, carriage, 3/8" x 4 1/2"
d	2	Washer, square 2 1/4"	j	1	Screw, lag, 1/2" x 4"
f	2	Pin, crossarm, steel, 5/8" x 14"	ee	1	Letters, 2 "C", 2 "N", with 1" nails
f	1	Pin, crossarm, steel, 5/8" x 10 3/4"	ek		Locknuts

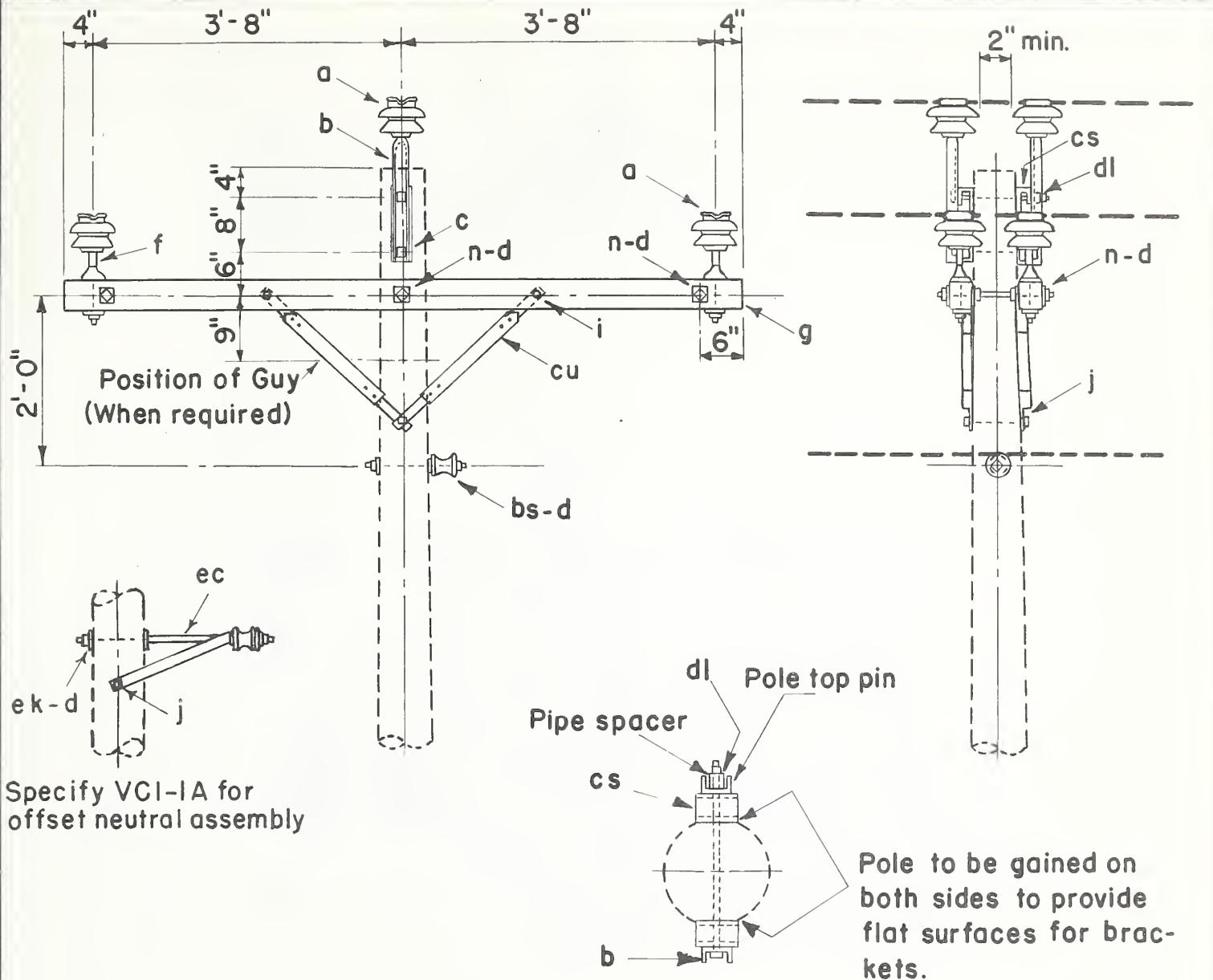
14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION- SINGLE LINE ARM



Specify VCIB for
offset neutral assembly

PLAN

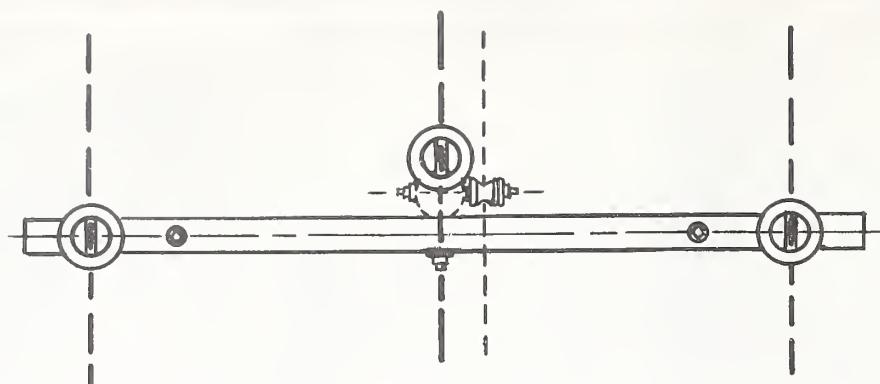
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL	
a	3	Insulator, pin type	cu	2	Brace, wood, 28"	
b	1	Pin, pole top, 20"	i	2	Bolt, carriage, 3/8" x 4 1/2"	
c	3	Bolt, machine, 5/8" x req'd. length	j	1	Screw, lag, 1/2" x 4", (VCIB only)	
d	4	Washer, square 2 1/4"	bs	1	Bolt, single upset, insulated,(VCIB only)	
f	2	Pin, crossarm, steel, 5/8"x 14"	ek		Locknuts	
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	ec	1	Bracket, offset, insulated,(VCIB only)	
j	3	Screw,lag, 1/2"x 4", (VCIB only)	14.4/24.9 KV, 3-PHASE CROSSARM CONSTRUCTION-SINGLE PRIMARY SUPPORT 0° TO 5° ANGLE			
Jan. 1, 1963			VCI,VCIB			



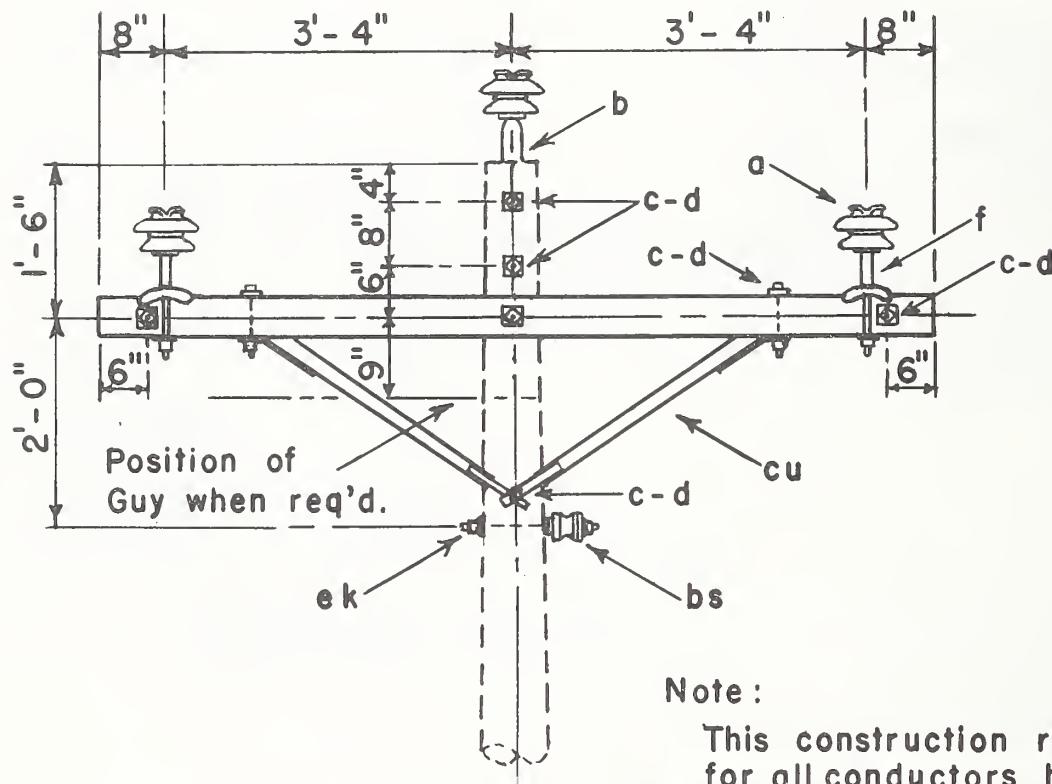
POLE TOP PIN ASSEMBLY

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	n	3	Bolt, double arming, $5/8"$ x reqd length
b	2	Pin, pole top, 20"	bs	1	Bolt, single upset, insulated (VCI-I only)
c	2	Bolt, machine, $5/8"$ x reqd length	cs	2	Pole top bracket
d	11	Washer, square $2\frac{1}{4}"$	dl	2	Pipe spacer, $3/4"$ dia. x $1\frac{1}{2}"$
f	4	Pin, crossarm, steel, $5/8"$ x 14"	ek		Locknuts
g	2	Crossarm, $3\frac{1}{2}"$ x $4\frac{1}{2}"$ x 8'-0"	j	2	Screw, lag, $1/2"$ x 4" (VCI-I only)
cu	4	Brace, wood, 28"	ec	1	Bracket, offset, insulated (VCI-IA only)
i	4	Bolt, carriage, $3/8"$ x $4\frac{1}{2}"$	j	4	Screw, lag, $1/2"$ x 4" (VCI-IA only)

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION
DOUBLE PRIMARY SUPPORT AT 0° TO 5° ANGLE

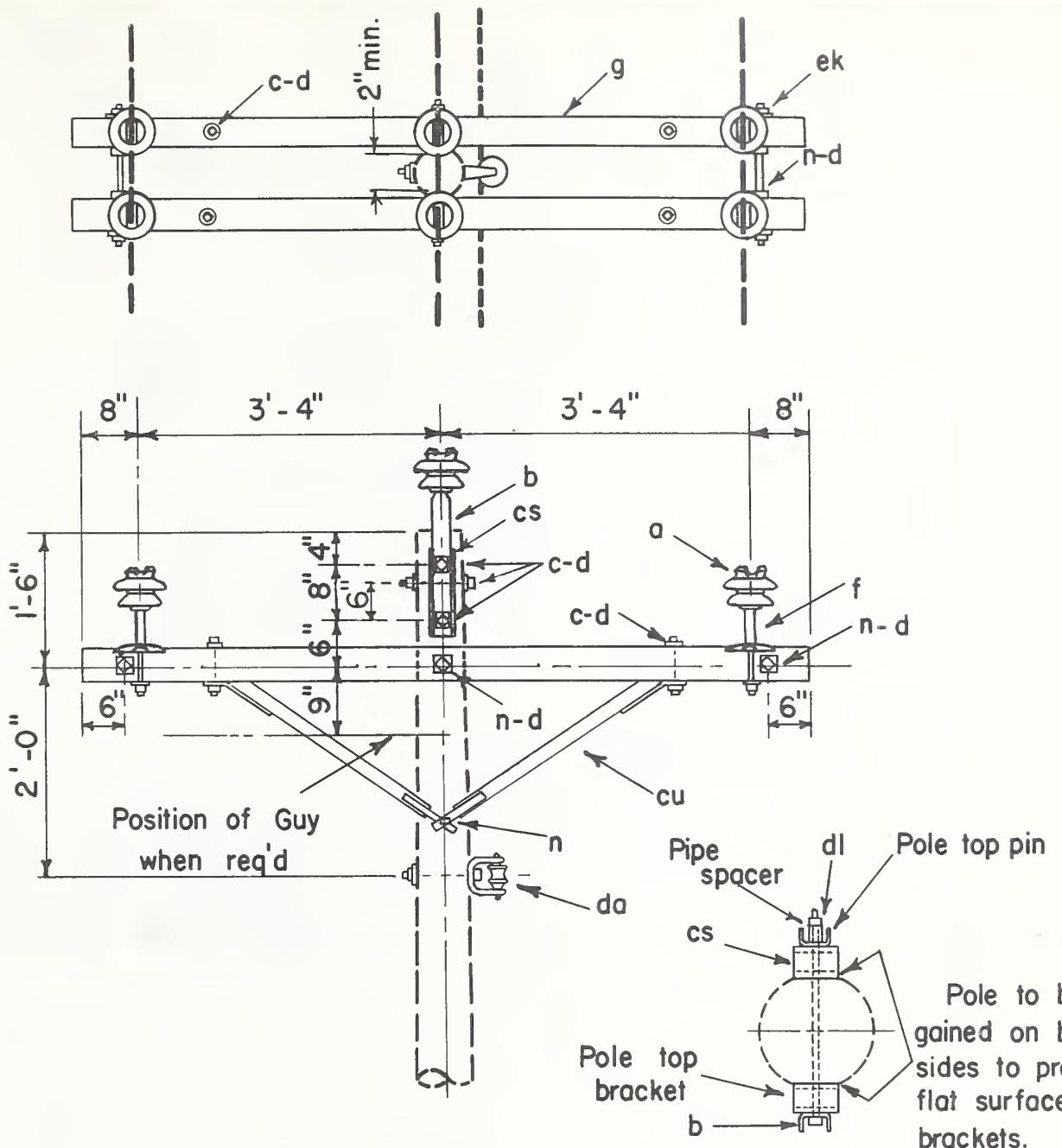


PLAN



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 3	Insulator, pin type	f 2	Pin, crossarm, clamp type
b 1	Pin, pole top, 20"	g 1	Crossarm, 3 3/4"x 4 3/4"x 8'-0"
c 2	Bolt, machine, 1/2"x req'd. length	bs 1	Bolt, single upset, insulated
c 6	Bolt, machine, 5/8"x req'd. length	cu 1	Brace, wood, 60" span
d 2	Washer, round, 1 3/8" dia.	ek	Locknuts
d 10	Washer, square, 2 1/4"		

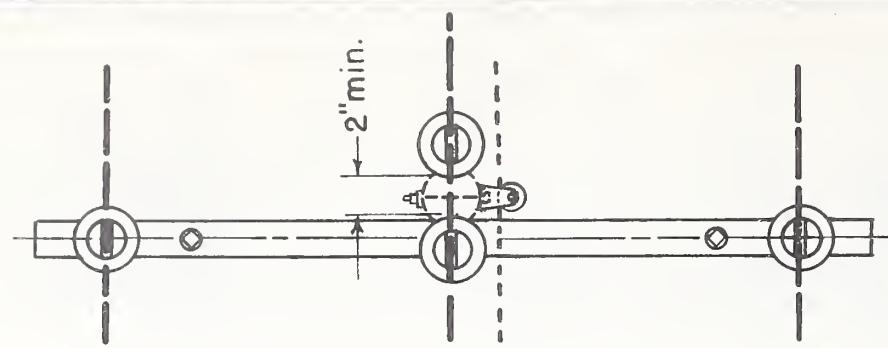
14.4 / 24.9 KV.
3-PHASE CROSSARM CONSTRUCTION- 0° TO 2° ANGLE
(LARGE CONDUCTORS)



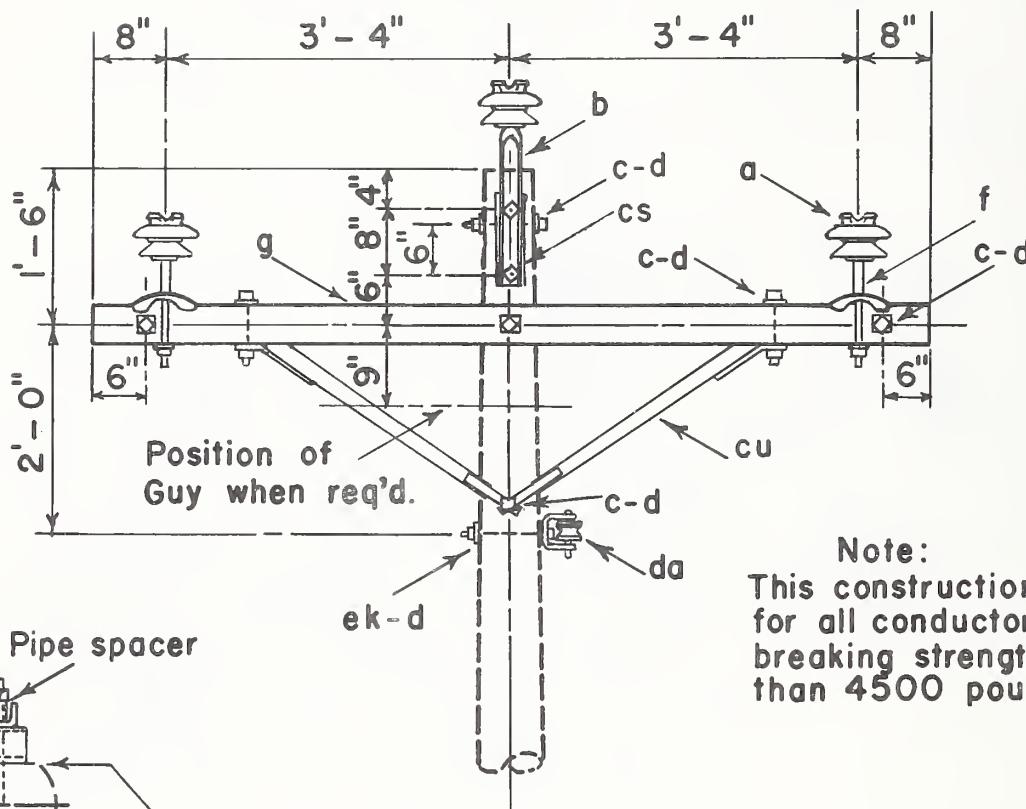
POLE TOP PIN ASSEMBLY

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	g	2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"
b	2	Pin, pole top, 20"	n	4	Bolt, double arming, 5/8" x req'd. length
c	4	Bolt, machine, 5/8" x req'd. length	cs	2	Pole top bracket
c	4	Bolt, machine, 1/2" x req'd. length	cu	2	Brace, wood, 60" span
d	13	Washer, square 2 1/4"	da	1	Bracket, insulated
d	4	Washer, rd., 1 3/8" diam.	dl	2	Pipe spacer, 3/4" dia. x 1 1/2"
f	4	Pin, crossarm, steel, clamp type	ek		Locknuts

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DOUBLE PRIMARY SUPPORT
0° TO 5° ANGLE (LARGE CONDUCTORS)



PLAN



Note:
This construction required
for all conductors having a
breaking strength of more
than 4500 pounds.

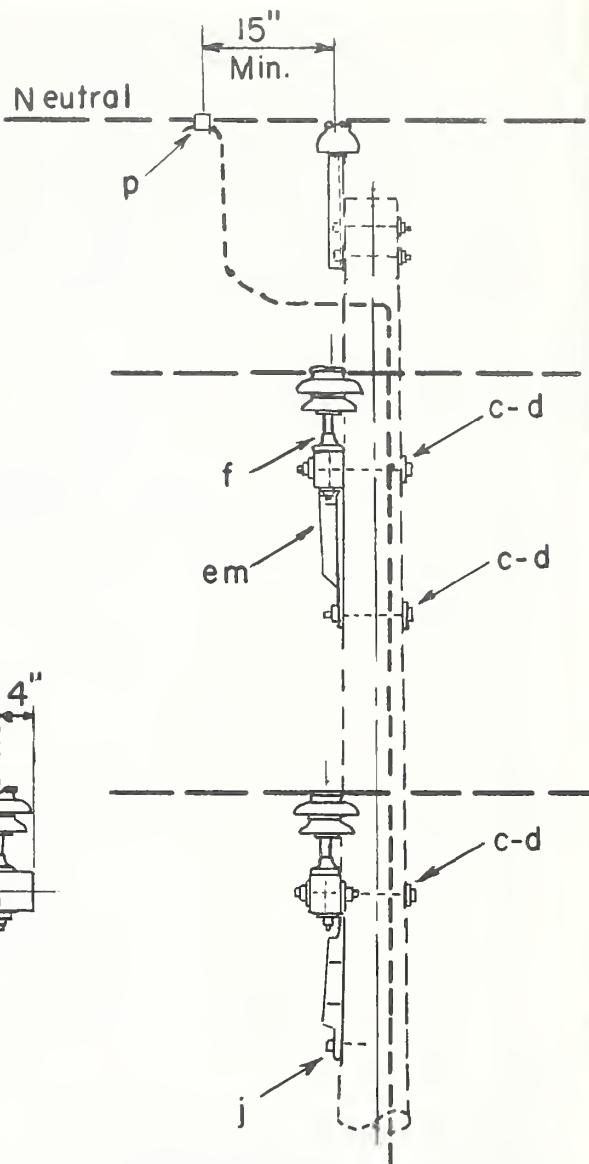
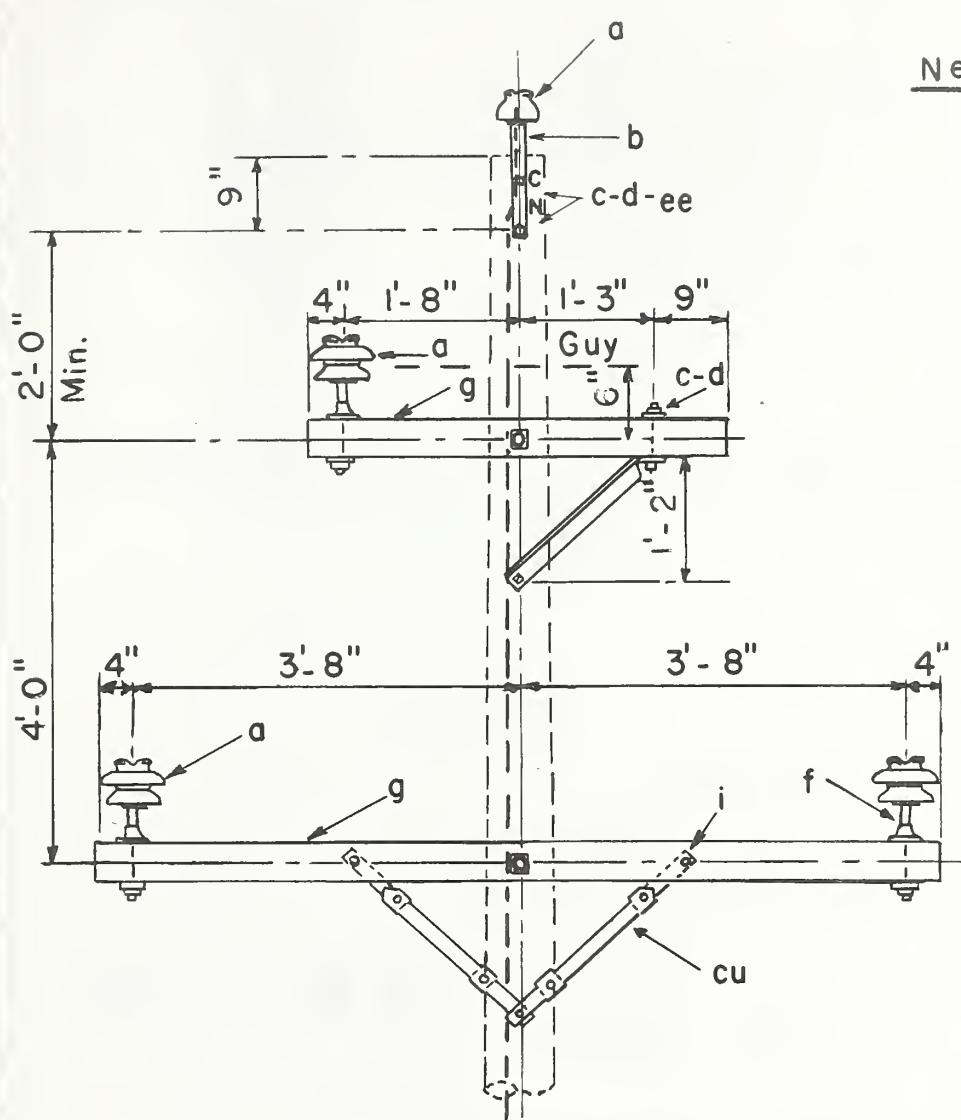
Note:

**POLE TOP PIN
ASSEMBLY**

Pole to be gained on both
sides to provide flat surfaces
for brackets.

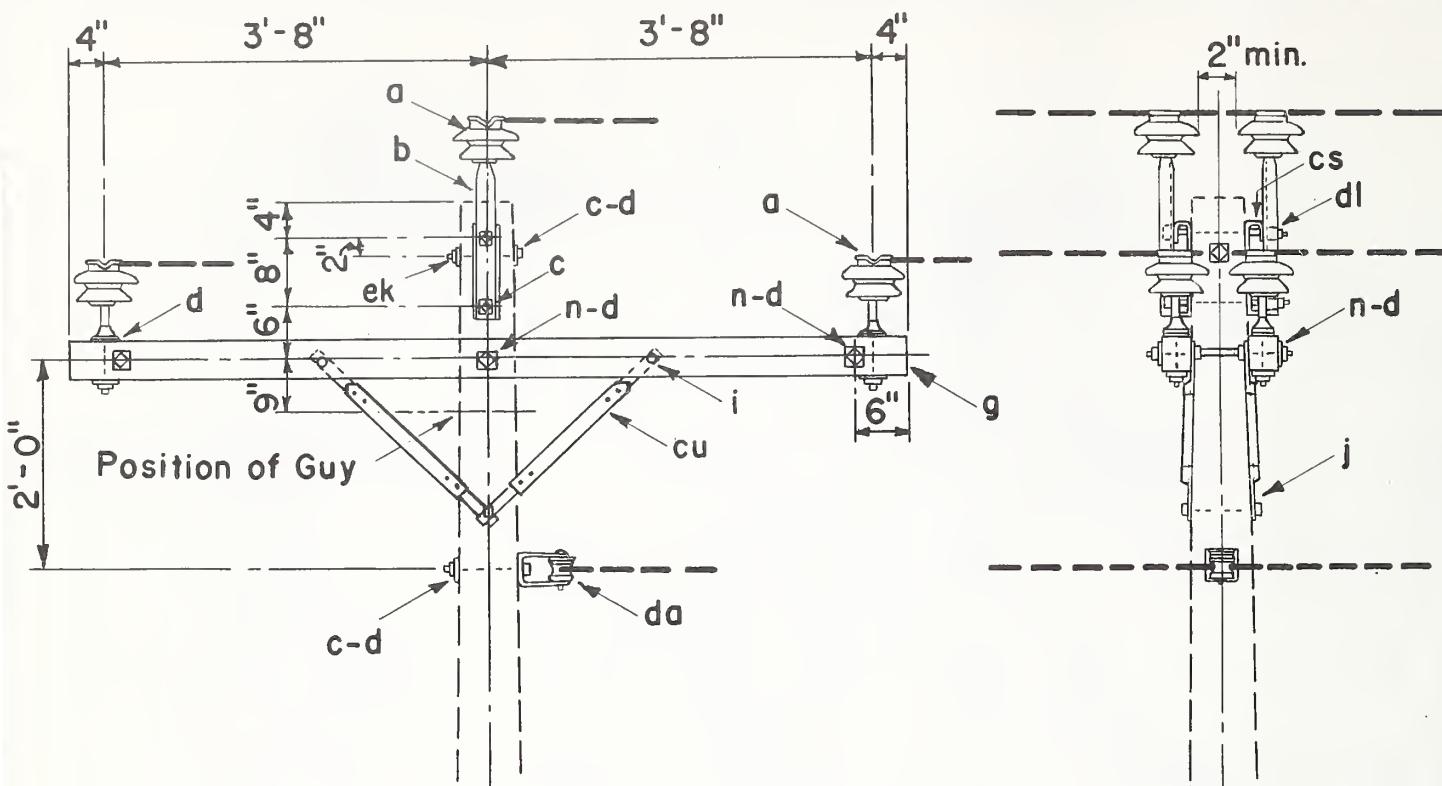
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	4	Insulator, pin type	f	2	Pin, crossarm, clamp type
b	2	Pin, pole top, 20"	g	1	Crossarm, 3 3/4"x 4 3/4"x 8'-0"
c	8	Bolt, machine, 5/8"x req'd. length	cu	1	Brace, wood, 60" span
c	2	Bolt, machine, 1/2"x req'd. length	da	1	Bracket, insulated
d	10	Washer, square, 2 1/4"	dl	2	Pipe spacer, 3/4" dia. x 1 1/2"
d	2	Washer, round, 1 3/8" dia.	ek		Locknuts
cs	2	Pole top bracket			

14.4 / 24.9 KV.
3-PHASE CROSSARM CONSTRUCTION-2° TO 5° ANGLE
(LARGE CONDUCTORS)



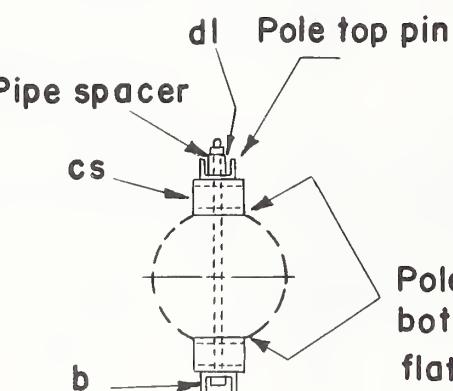
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	3	Insulator, pin type	g	1	Crossarm, 3-1/2" x 4-1/2" x 8'-0"
a	1	Insulator, pin type, (7.2/12.5 KV)	i	2	Bolt, carriage, 3/8" x 4-1/2"
b	1	Pin, pole top	j	1	Screw, lag 1/2" x 4"
c	6	Bolt, machine; 5/8" x req'd length	p		Connectors, as required
d	8	Washer, 2-1/4" square	em	1	Brace, crossarm, special
f	3	Pin, crossarm, steel, 5/8"x 14"	cu	2	Brace, wood 28"
g	1	Crossarm, 3-1/2" x 4-1/2" x 4'-0"	ee	4	Letters 2-C, 2-N with 1" noils

14.4/24.9 KV., SINGLE PRIMARY SUPPORT
WITH OVERHEAD NEUTRAL



Note:

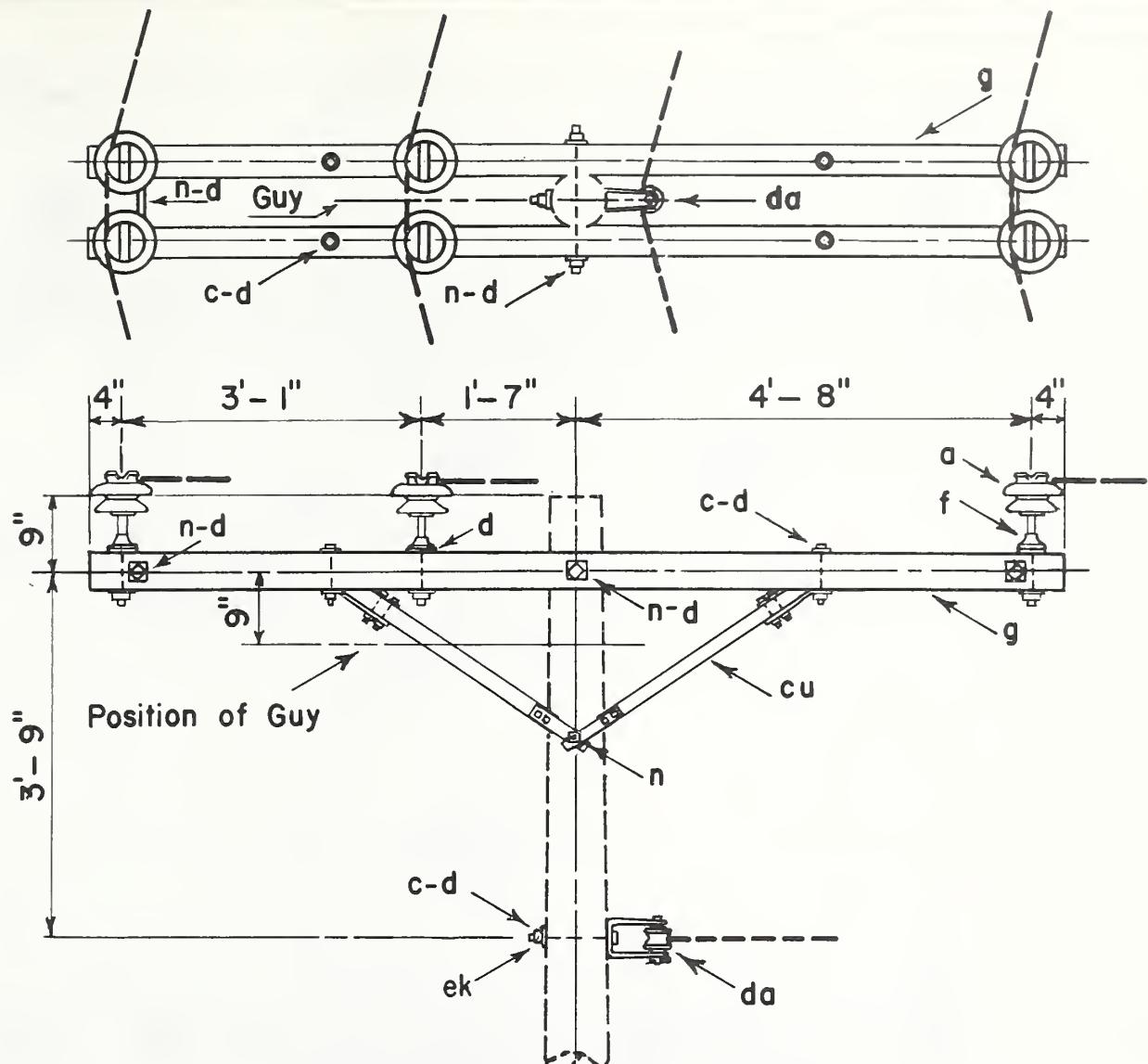
When the transverse load is more than 500 pounds per pin, substitute VC2-1 or VC2-2 as required.



POLE TOP PIN ASSEMBLY

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 6	Insulator, pin type	i 4	Bolt, carriage, $\frac{3}{8}$ " x 4 $\frac{1}{2}$ "
b 2	Pin, pole top, 20"	j 2	Screw, lag, $\frac{1}{2}$ " x 4"
c 4	Bolt, machine, $\frac{5}{8}$ " x req'd length	n 3	Bolt, double arming, $\frac{5}{8}$ " x req'd length
d 13	Washer, square 2 $\frac{1}{4}$ "	cs 2	Pole top bracket
d 4	Washer, square, 3"	da 1	Bracket, insulated
f 4	Pin, crossarm, steel, $\frac{5}{8}$ " x 14"	dl 2	Pipe spacer, $\frac{3}{4}$ " dia. x 1 $\frac{1}{2}$ "
g 2	Crossarm, 3 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ " x 8'-0"	ek	Locknuts
cu 4	Brace, wood, 28"		

14.4/24.9 KV, 3-PHASE
 CROSSARM CONSTR.-DOUBLE PRIMARY SUPPORT
 MAX. TRANSVERSE LOADING 500 LBS./PIN
 (5° TO 30° MAX. ANGLE)

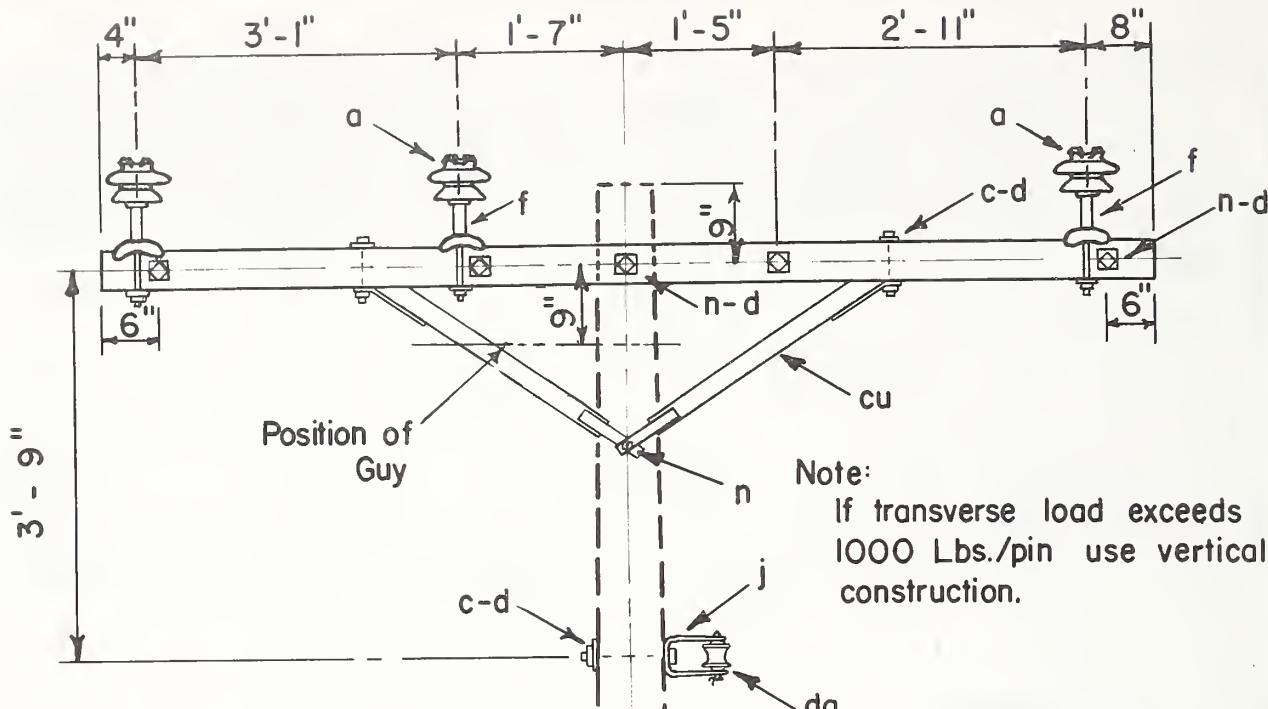


Notes:

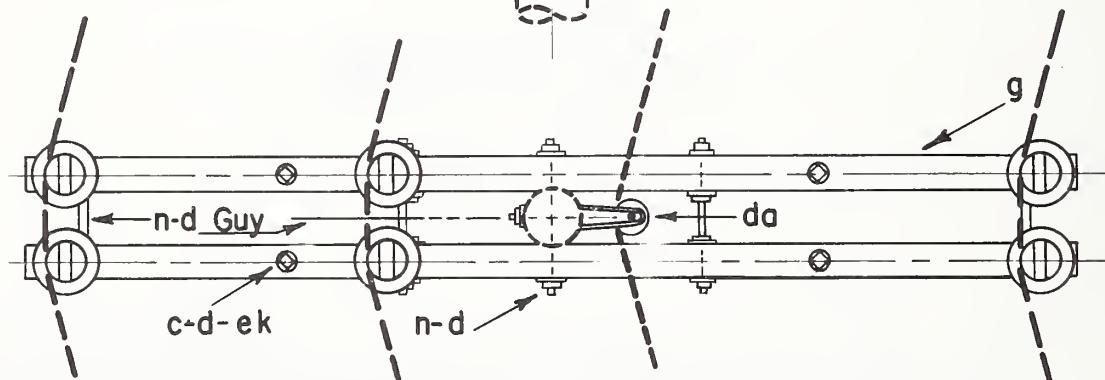
1. Center phase wire or neutral wire may be located on the opposite side of the pole where necessary to avoid crossing of wires in midspan.
2. Neutral may also be mounted on the crossarm.
3. When the transverse load is more than 750 pounds per pin, construction similar to VC2-2 should be used.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	f	6	Pin, crossarm, steel, 5/8"x 14"
c	1	Bolt, machine, 5/8"x req'd. length	g	2	Crossarm, 3 3/4"x 4 3/4"x 10'-0"
c	4	Bolt, machine, 1/2" x req'd. length	n	4	Bolt, double arming, 5/8"x req'd. lgth.
d	11	Washer, square, 2 1/4"	cu	2	Brace, wood, 60" span
d	4	Washer, round, 1 3/8" dia.	da	1	Bracket, insulated
d	6	Washer, square, 3"	ek		Locknuts

14.4/24.9 KV. 3 PHASE
CROSSARM CONSTR. DOUBLE PRIMARY SUPPORT
MAX. TRANSVERSE LOADING 750 LBS/PIN
5° TO 30° MAX. ANGLE



PLAN



Notes:

- I. Side groove of insulator must always be larger than the overall diameter of conductor including armor rods when required.
2. Center phase wire or neutral wire may be located on the opposite side of the pole where necessary to avoid crossing of wires in midspan.
3. This construction required for all conductors having a breaking strength of more than 4,500 pounds.

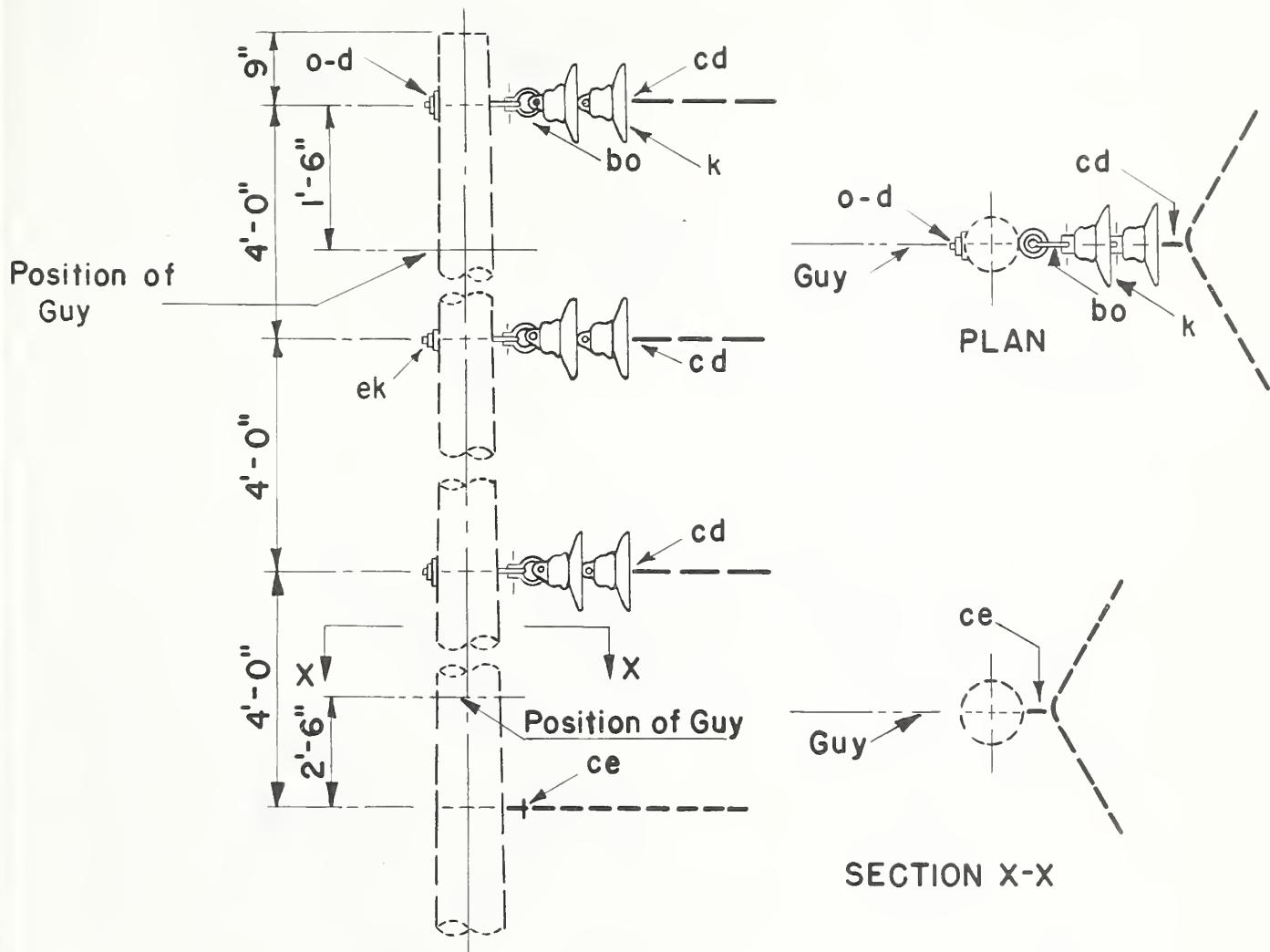
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
c	1	Bolt, machine, 5/8" x req'd. length	j	2	Screw, lag, 1/2" x 4"
c	4	Bolt, machine, 1/2" x req'd. length	n	6	Bolt, double arming, 5/8" x req'd. length
d	19	Washer, square 2 1/4"	cu	2	Brace, wood, 60" span
d	4	Washer, rd., 1 3/8" diam.	da	1	Bracket, insulated
f	6	Pin, crossarm, steel, clamp type	ek		Locknuts

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DOUBLE PRIMARY SUPPORT
(LARGE CONDUCTORS)
MAXIMUM TRANSVERSE LOADING- 1000 LBS. / PIN

Jan. 1, 1963

5° TO 30° MAX. ANGLE

VC2-2

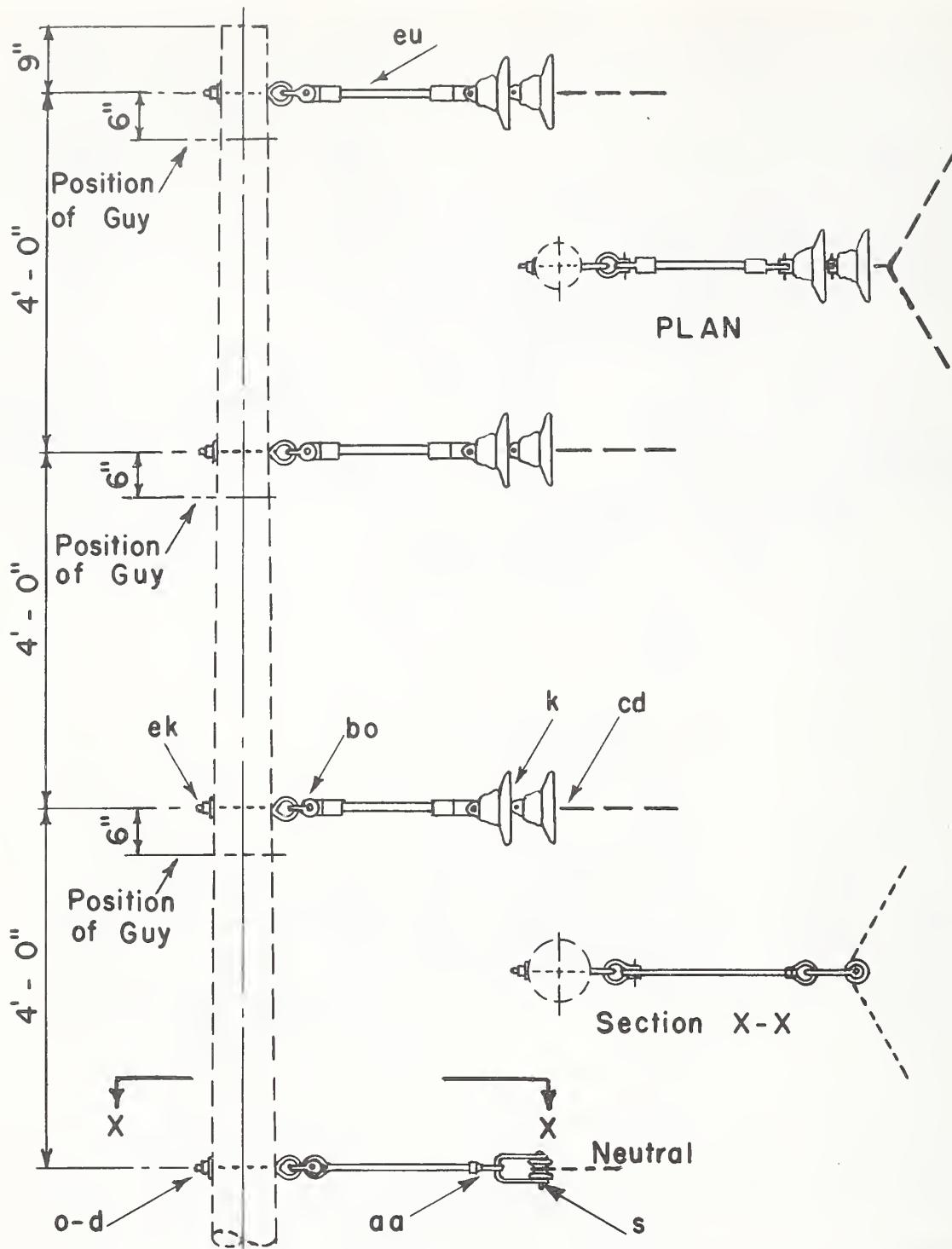


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 3	Washer, square 2 1/4"	bo 3	Shackle, anchor
k 6	Insulator, suspension, 10"	cd 3	Angle assembly, primary
o 3	Bolt, eye, 5/8" x req'd length	ce 1	Angle assembly, neutral
		ek	Locknuts

14.4/24.9 KV. PRIMARY, 3-PHASE
VERTICAL CONSTRUCTION - 30° TO 60° ANGLE

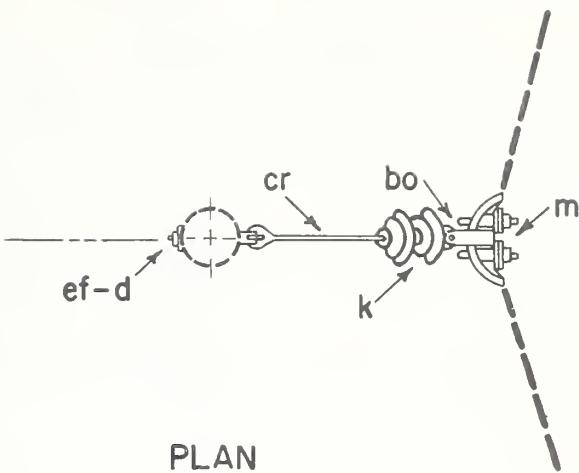
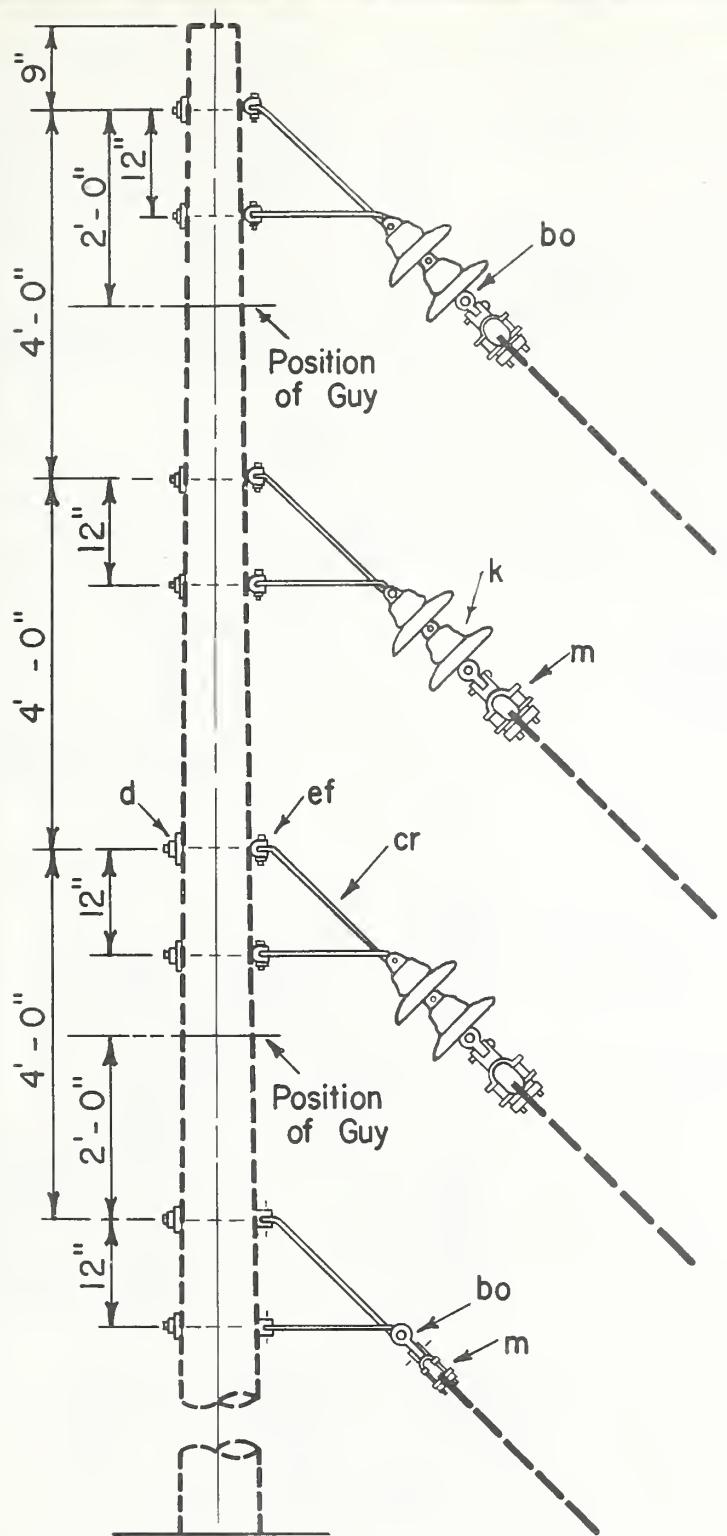
Jan. 1, 1963

VC3



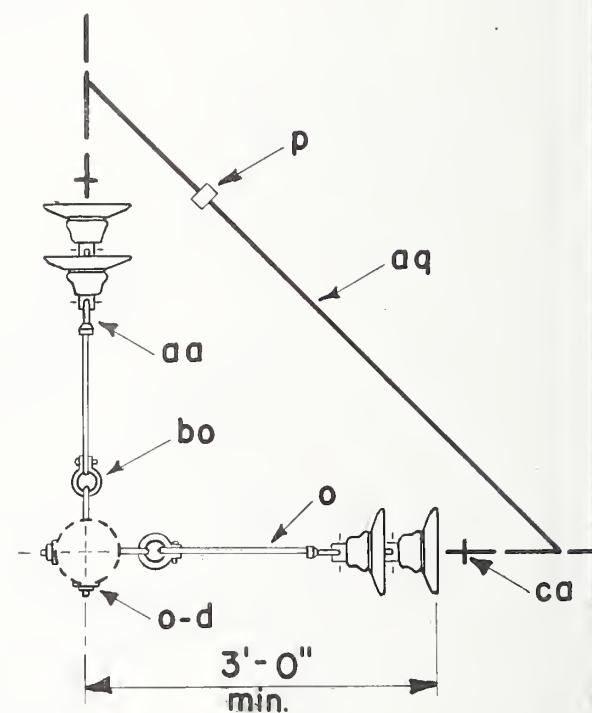
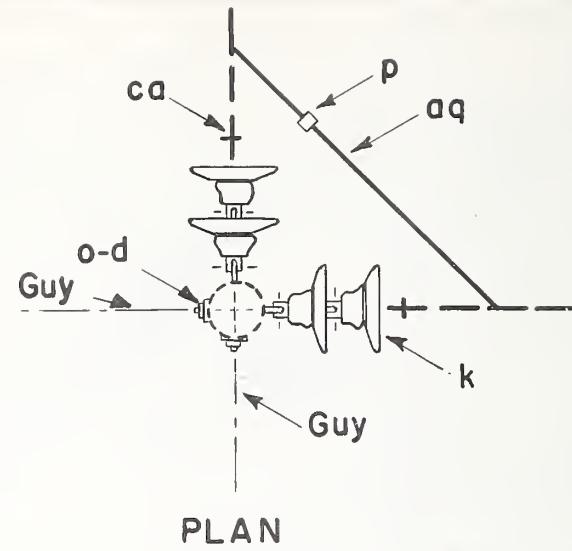
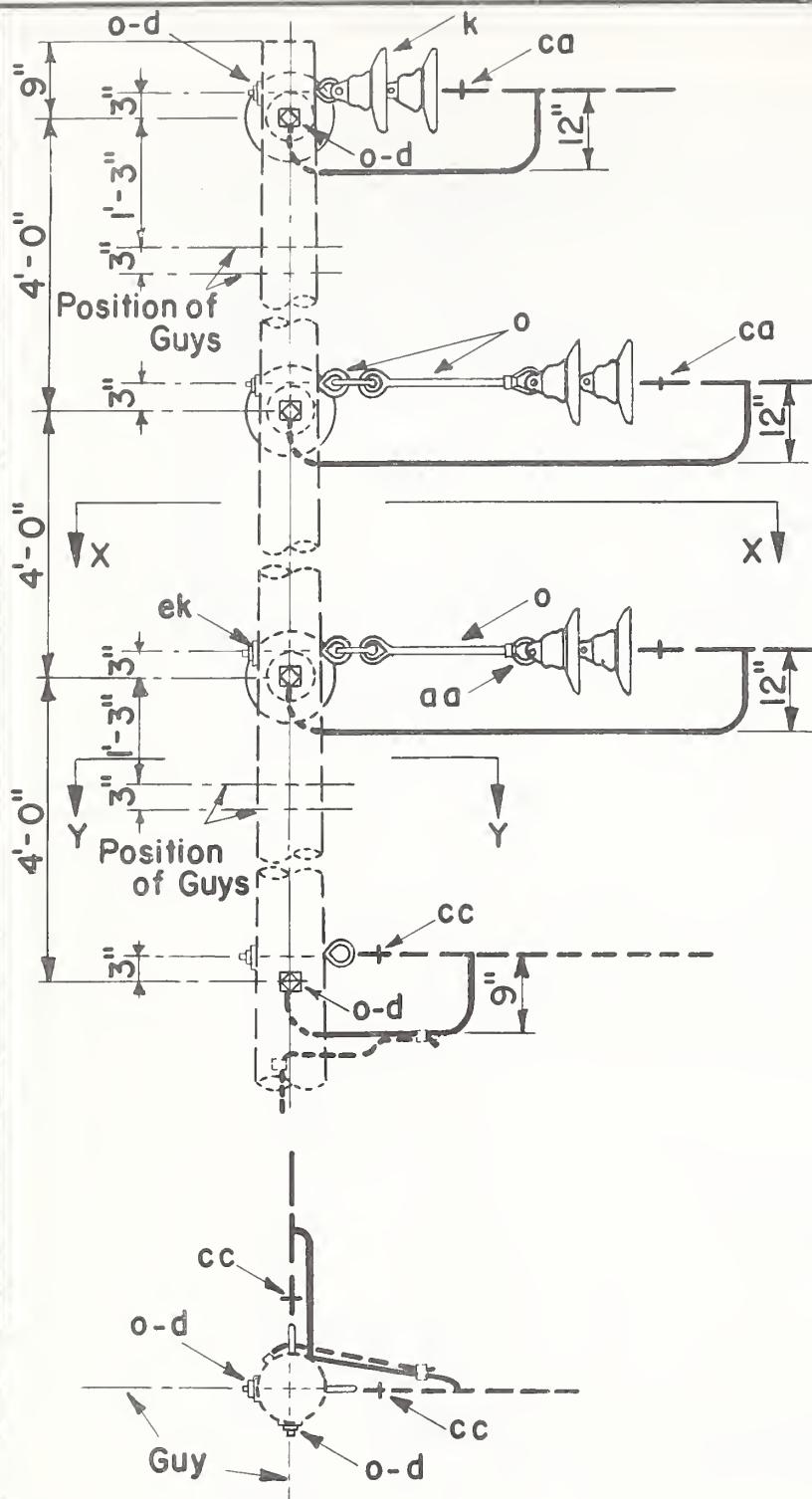
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	4	Washer, square, 2 1/4"	bo	4	Shackle, anchor
k	6	Insulator, suspension, 10"	cd	3	Angle assembly, primary
o	5	Bolt, eye, 5/8" x required length	ek		Locknuts
s	1	Clevis, secondary, swinging, insulated	eu	3	Link, extension, insulated
aa	1	Nut, eye, 5/8"			

14.4/24.9 KV - THREE PHASE
VERTICAL CONSTRUCTION, 30° TO 60° ANGLE
LARGE CONDUCTORS



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	8	Washer, square, 2 1/4"	cr	4	Bracket, angle, 5/8"
k	6	Insulator, suspension, 10"	ef	8	Bolt, clevis, 5/8" x req'd. length
m	4	Clamp, suspension	ek		Locknuts
bo	4	Shackle, anchor			

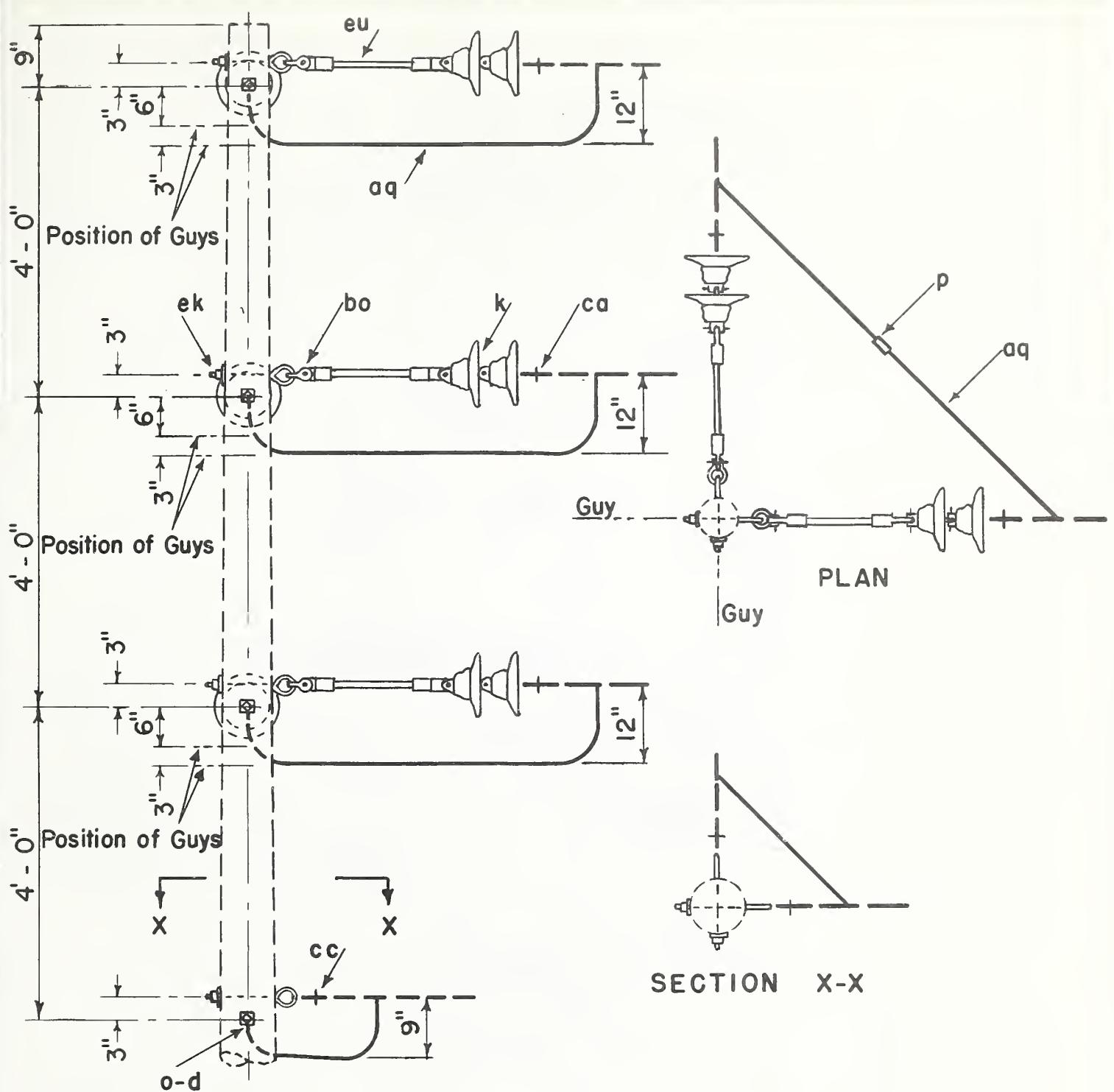
14.4/24.9 KV
VERTICAL CONSTRUCTION 10° TO 20° ANGLE
(LARGE CONDUCTORS)



SECTION X-X

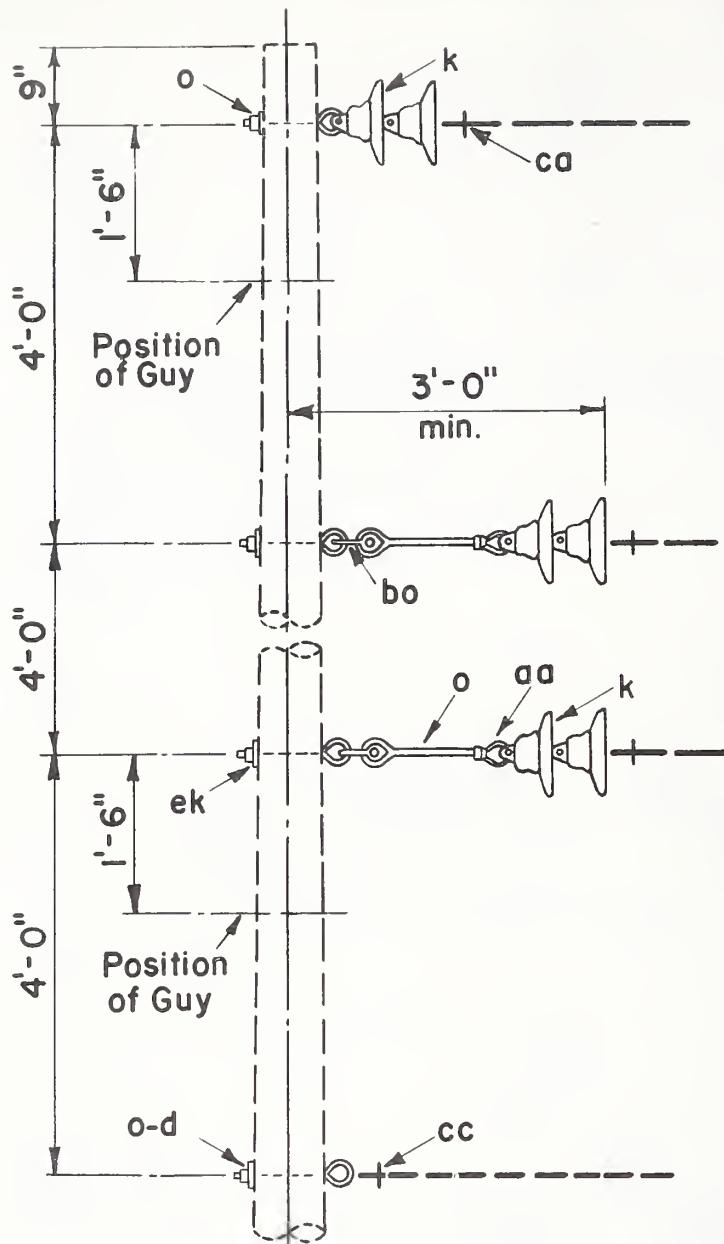
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 8	Washer, square $2\frac{1}{4}$ "	bo 4	Shackle, anchor
k 12	Insulator, suspension, 10"	ca 6	Deadend assembly, primary
o 12	Bolt, eye, $\frac{5}{8}$ " x req'd length	cc 2	Deadend assembly, neutral
o	Connectors, as required	ek	Locknut
aa 4	Nut, eye, $\frac{5}{8}$ "		
aq	Jumpers, as required		

14.4/24.9 KV, 3-PHASE
VERTICAL CONSTRUCTION - 60° TO 90° ANGLE



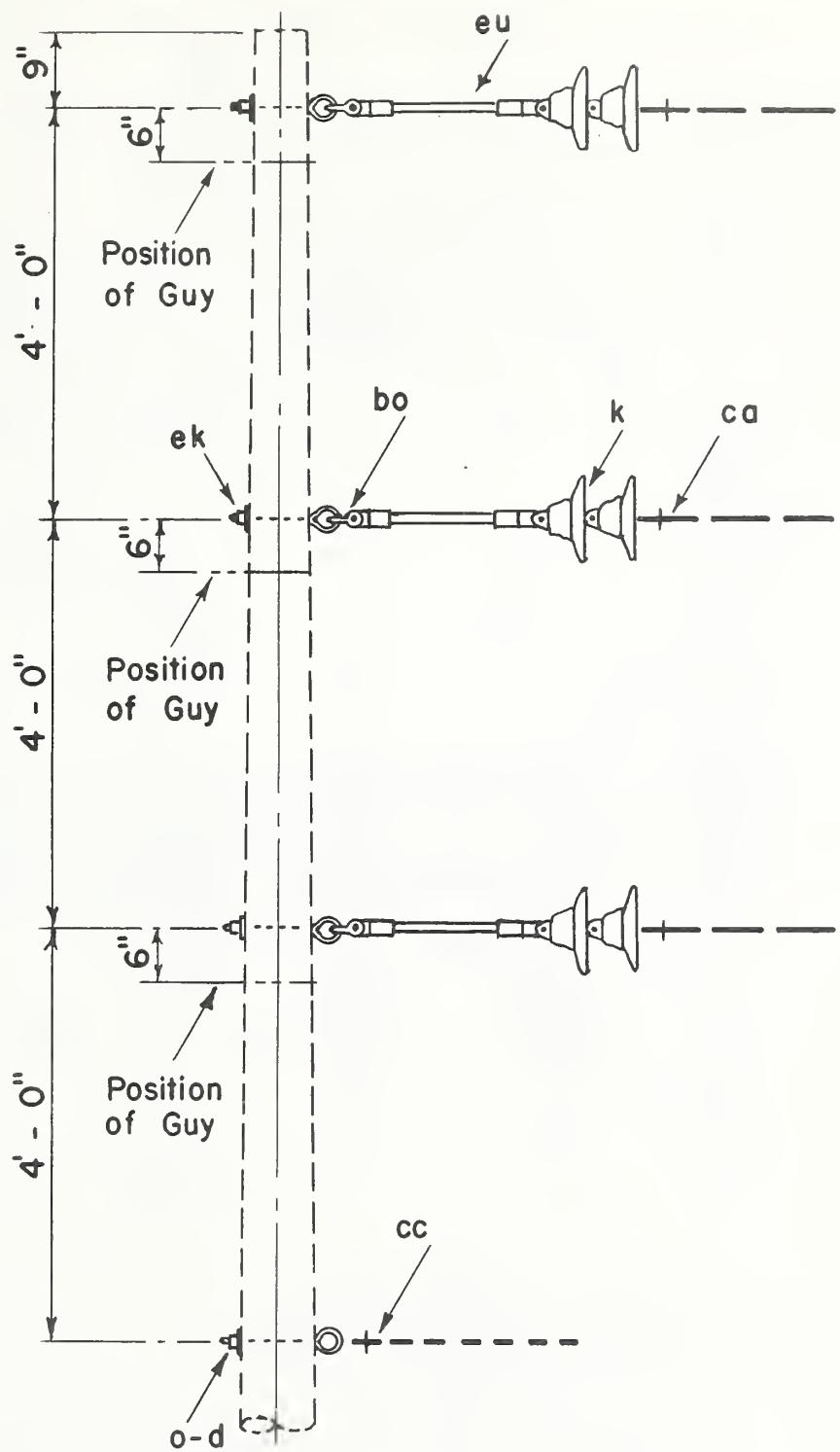
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	8	Washer, Square, 2 1/4"	ca	6	Deadend assembly, primary
k	12	Insulator, suspension, 10"	cc	2	Deadend assembly, neutral
o	8	Bolt, eye, 5/8" x required length	ek		Locknuts
p		Connectors, as required	eu	6	Link, extension, insulated
aq		Jumpers, as required			
bo	6	Shackle, anchor			

14.4/24.9 KV - THREE PHASE
 VERTICAL CONSTRUCTION, 60° To 90° ANGLE
 LARGE CONDUCTORS



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 4	Washer, square $2\frac{1}{4}$ "	ca 3	Deadend assembly, primary
k 6	Insulator, suspension, 10"	cc 1	Deadend assembly, neutral
o 6	Bolt, eye, $\frac{5}{8}$ " x req'd length	ek	Locknuts
aa 2	Nut, eye, $\frac{5}{8}$ "		
bo 2	Shackle, anchor		

14.4/24.9 KV, 3-PHASE
VERTICAL CONSTRUCTION-DEADEND (SINGLE)

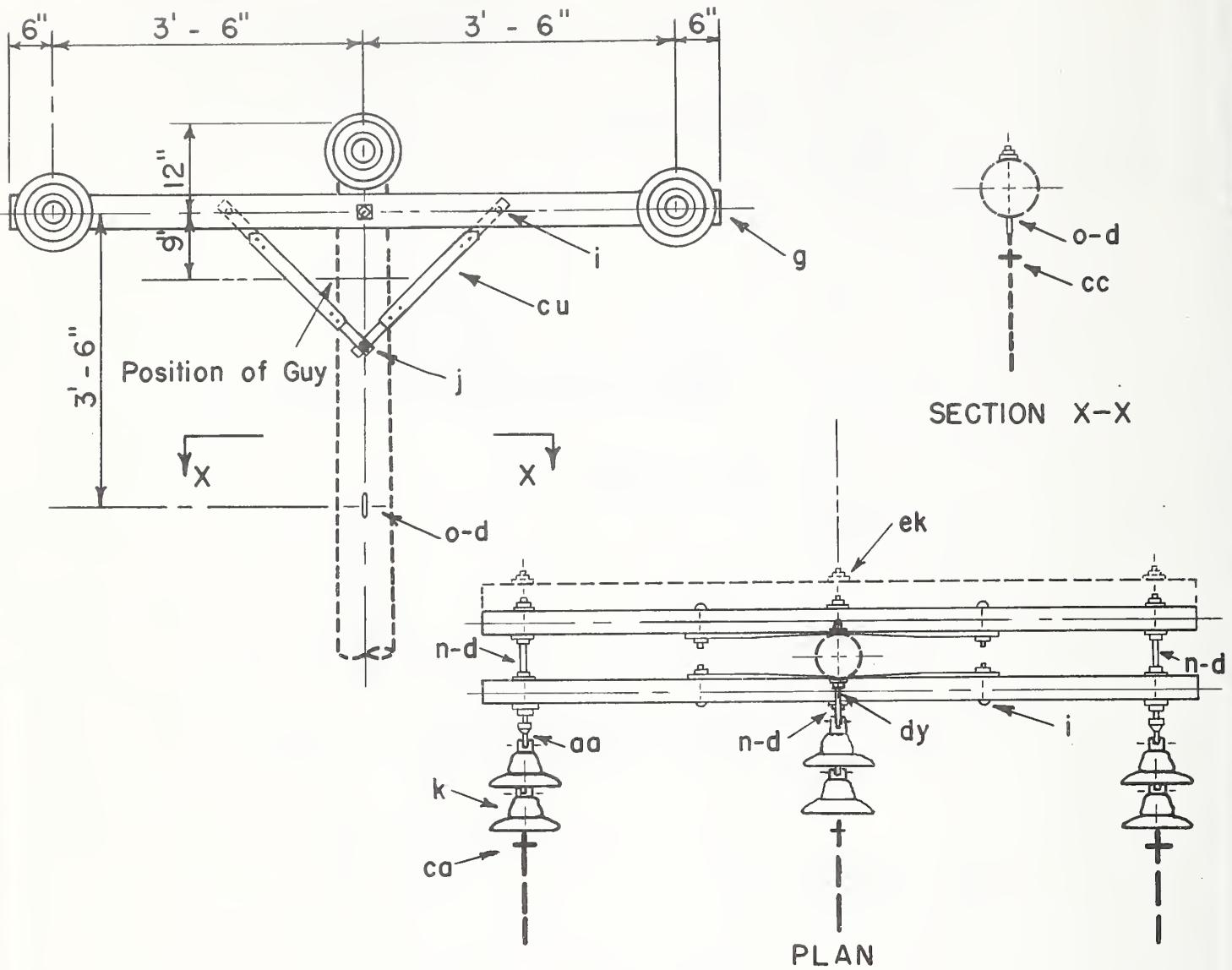


ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	4	Washer, square, 2 1/4"	cc	1	Deadend assembly, neutral
k	6	Insulator, suspension, 10"	ek		Locknuts
o	4	Bolt, eye, 5/8"x required length	eu	3	Link, extension, insulated
bo	3	Shackle, anchor			
ca	3	Deadend assembly, primary			

14.4/24.9 KV - THREE PHASE
VERTICAL CONSTRUCTION, DEADEND (SINGLE)
LARGE CONDUCTORS

Jan. 1, 1963

VC5-IL

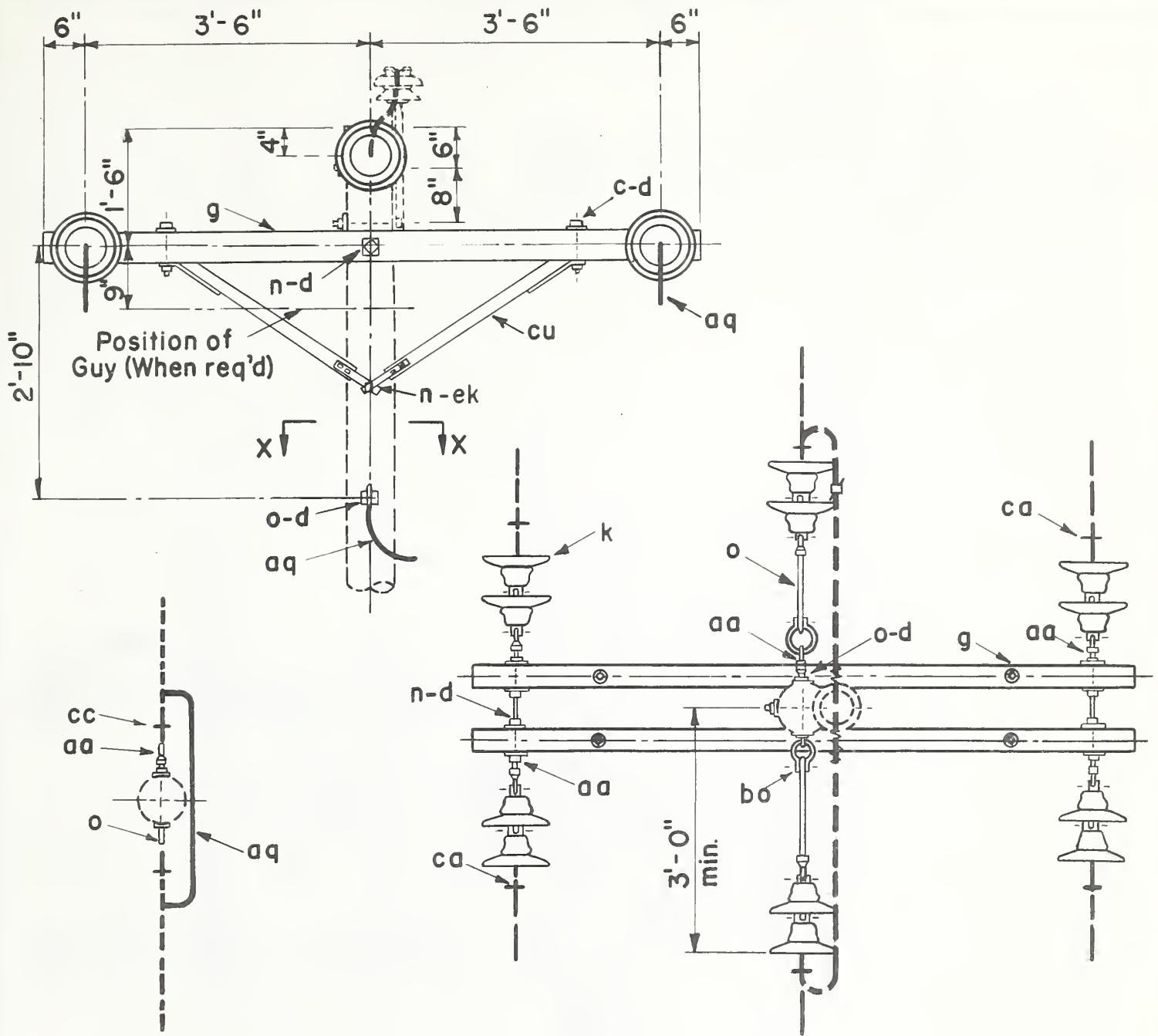


Notes:

1. See drawing VE5-1 for crossarm loading limitations.
2. Designate as VC7-1 for assembly with three crossarms.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	13	Washer, square, 2 1/4"	n	3	Bolt, double arming, 5/8" x req'd. length
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	o	1	Bolt, eye, 5/8" x req'd. length
cu	4	Brace, wood, 28"	aa	2	Nut, eye, 5/8"
i	4	Bolt, carriage, 3/8" x 4 1/2"	ca	3	Deadend assembly, primary
j	2	Screw, lag, 1/2"x 4"	cc	1	Deadend assembly, neutral
k	6	Insulator, suspension, 10"	ek		Locknuts
dy	1	Bolt, eye, double arming 5/8"			

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION- DEADEND (SINGLE)

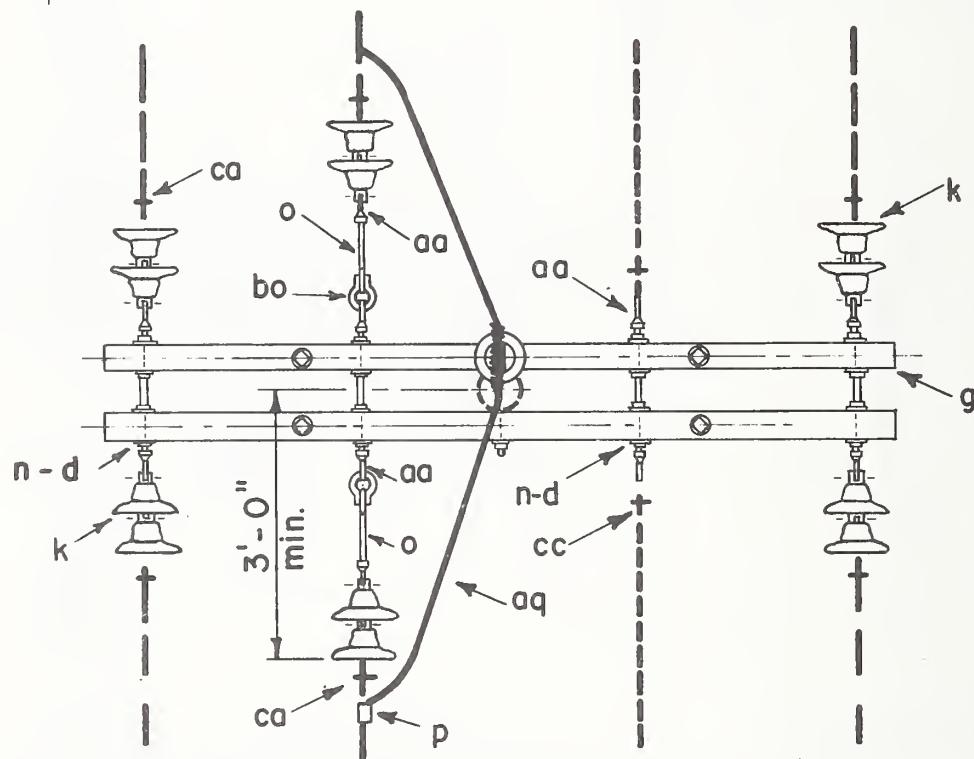
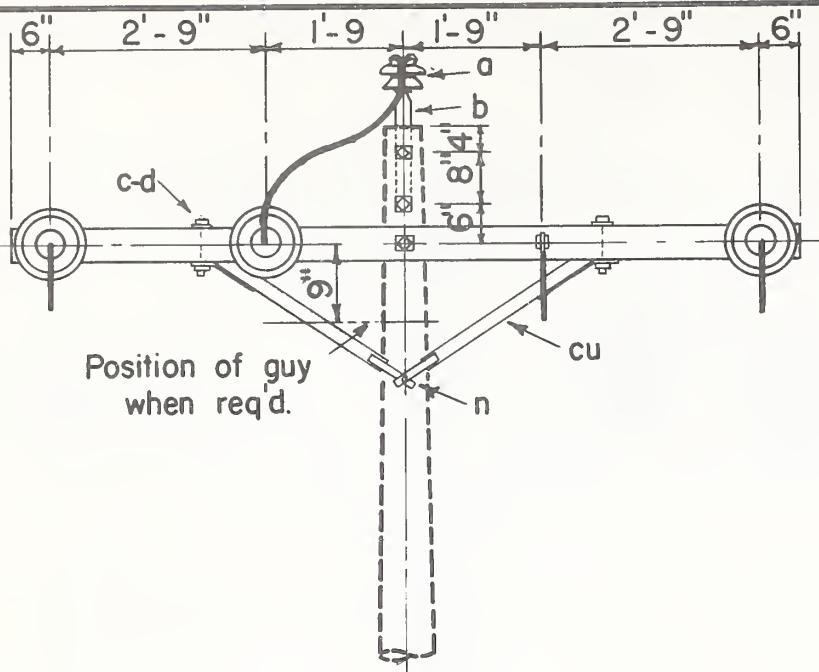


SECTION X-X

PLAN

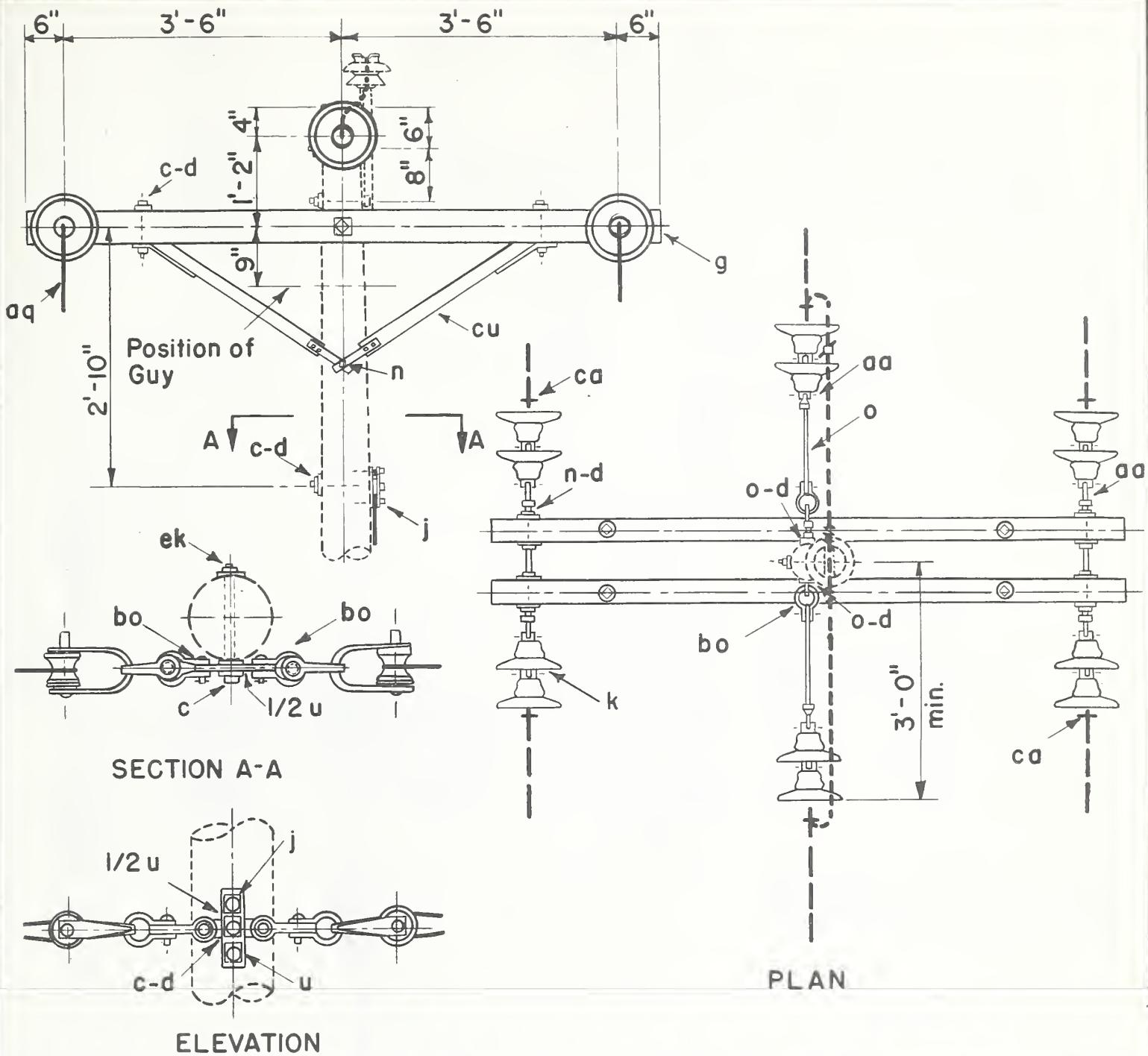
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 4	Bolt, machine, $1/2"$ x req'd length	p	Connectors, as required
d 14	Washer, square $2\frac{1}{4}"$	aa 8	Nut, eye, $5/8"$
d 4	Washer, round, $1\frac{3}{8}"$ diam.	aq	Jumpers and leads as required
g 2	Crossarm, $3\frac{1}{2}" \times 4\frac{1}{2}" \times 8'-0"$	bo 2	Shackle, anchor
k 12	Insulator, suspension, 10"	ca 6	Deadend assembly, primary
n 4	Bolt, double arming, $5/8"$ x req'd length	cc 2	Deadend assembly, neutral
o 4	Bolt, eye, $5/8"$ x req'd length	cu 2	Brace, wood, 60" span
		ek	Locknuts

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DEADEND (DOUBLE)



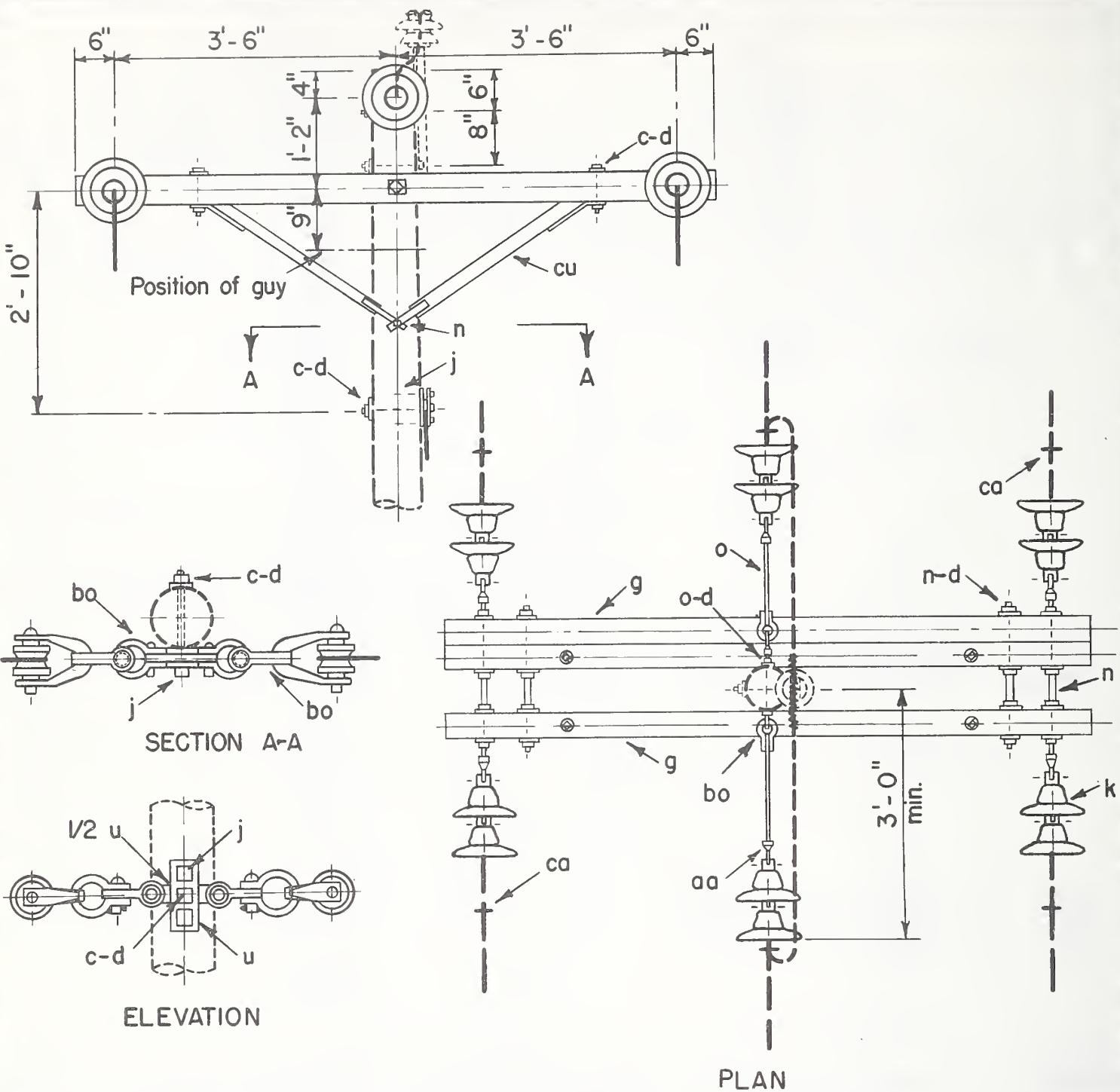
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	1	Insulator, pin type	o	2	Bolt, eye, 5/8" x req'd. length
c	2	Bolt, machine, 5/8" x req'd. length	p		Connectors, as req'd.
c	4	Bolt, machine, 1/2" x req'd. length	aa	10	Nut, eye, 5/8"
d	4	Washer, round, 1 3/8" dia.	aq		Jumpers or leads as required
d	20	Washer, square, 2 1/4"	bo	2	Shackle, anchor
b	1	Pin, pole top, 20"	ca	6	Deadend assembly, primary
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	cc	2	Deadend assembly, neutral
k	12	Insulator, suspension, 10"	cu	2	Brace, crossarm, wood, 60" span
n	6	Bolt, double arming, 5/8" x req'd. length	ek		Locknuts

14.4/24.9 KV, 3- PHASE
CROSSARM CONSTRUCTION- DEADEND (DOUBLE)



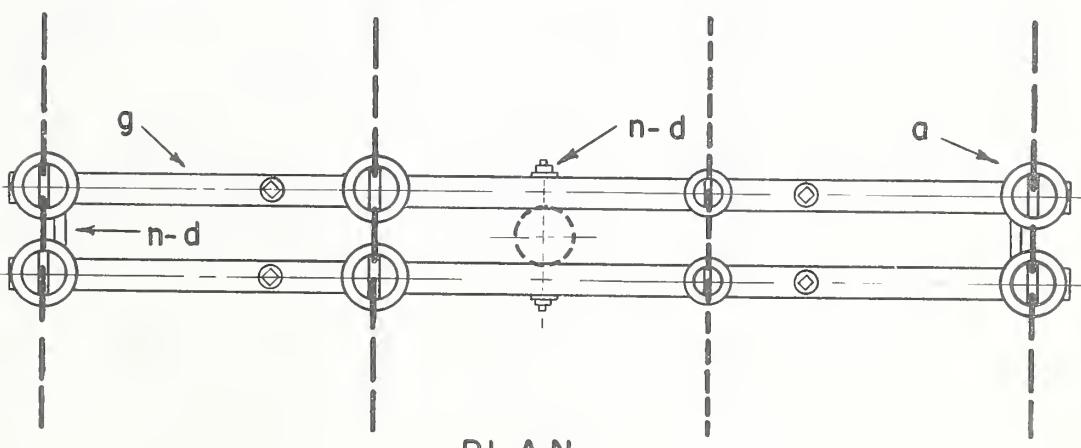
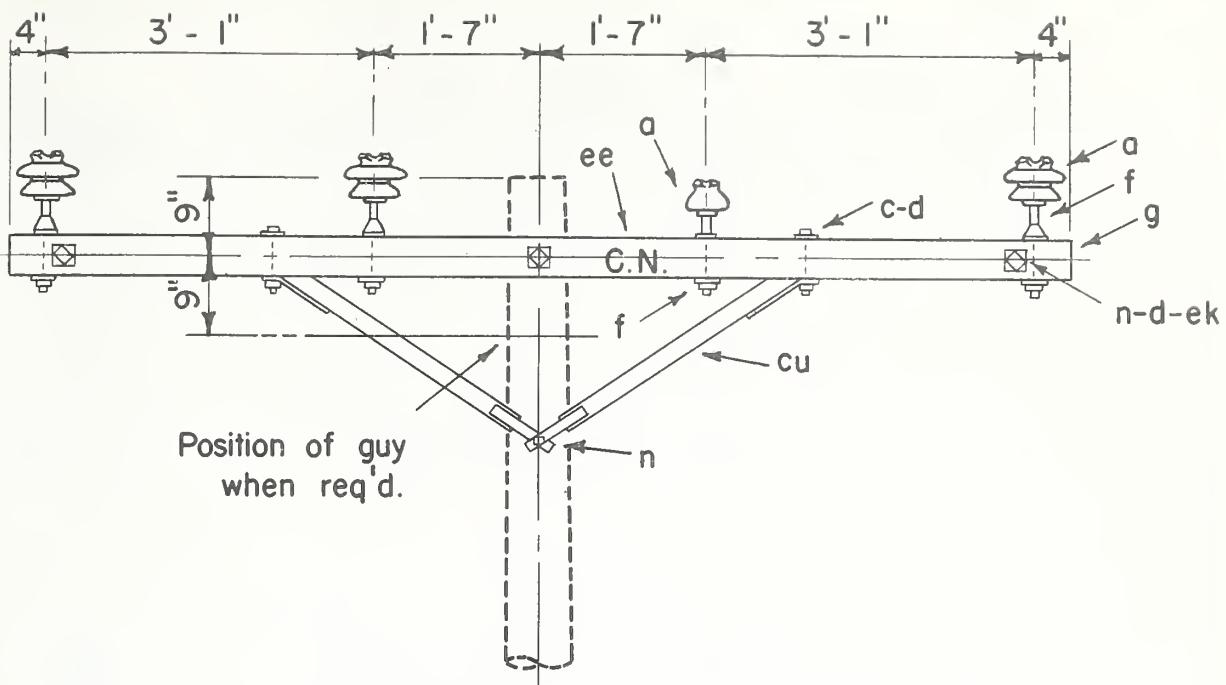
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 1	Bolt, machine, 5/8" x req'd length	u 1 1/2	Clamp, guy, 6" - heavy duty
c 4	Bolt, machine, 1/2" x req'd length	aa 7	Nut, eye, 5/8"
d 13	Washer, square, 2 1/4"	aq	Jumpers, as required
d 4	Washer, round, 1 3/8" dia.	bo 6	Shackle, anchor
g 2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"	ca 6	Deadend assembly, primary
j 2	Screw, lag, 1/2" x 4"	cc 2	Deadend assembly, neutral
k 12	Insulator, suspension, 10"	cu 2	Brace, wood, 60" span
n 4	Bolt, double arming, 5/8" x req'd length	ek	Locknuts
o 3	Bolt, eye, 5/8" x req'd length		
p	Connectors, as required		

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DEADEND (DOUBLE)
(LARGE CONDUCTORS)



ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL
c	1	Bolt, machine, 5/8" x req'd. length		u	1 1/2	Clamp, guy, 6" heavy duty
c	4	Bolt, machine, 1/2" x req'd. length		aa	7	Nut, eye, 5/8"
d	21	Washer, square, 2 1/4"		ag		Jumpers, as req'd.
d	4	Washer, round, 1 3/8"		bo	6	Shackle, anchor
g	3	Crossarm, 3 3/4" x 4 3/4" x 8'-0"		ca	6	Deadend assembly, primary
j	2	Screw, lag, 1/2" x 4"		cc	6	Deadend assembly, neutral
k	12	Insulator, suspension, 10"		cu	2	Brace, wood, 60" span
n	6	Bolt, double arming, 5/8" x req'd. length		ek		Locknuts
o	3	Bolt, eye, 5/8" x req'd. length				
p		Connectors, as req'd.				

14.4/24.9 KV, 3- PHASE
CROSSARM CONSTRUCTION- DEADEND (DOUBLE)
LARGE CONDUCTORS WITH UNBALANCED LOADS

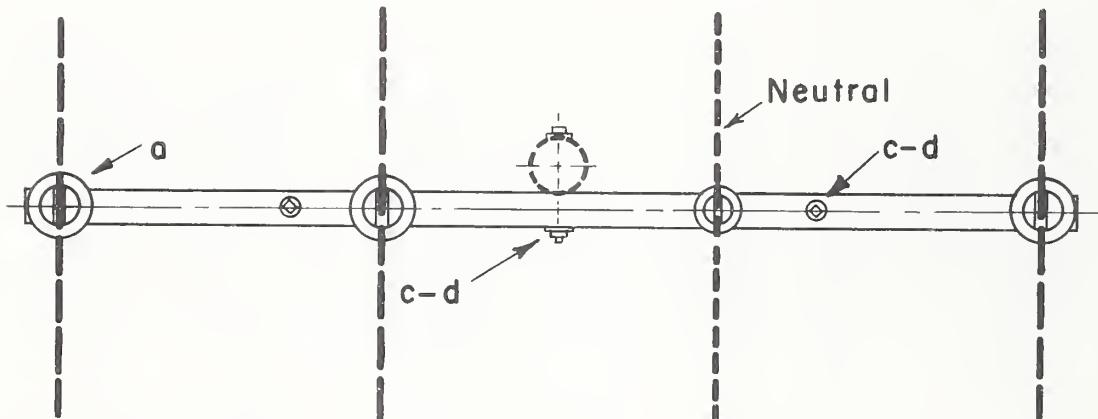
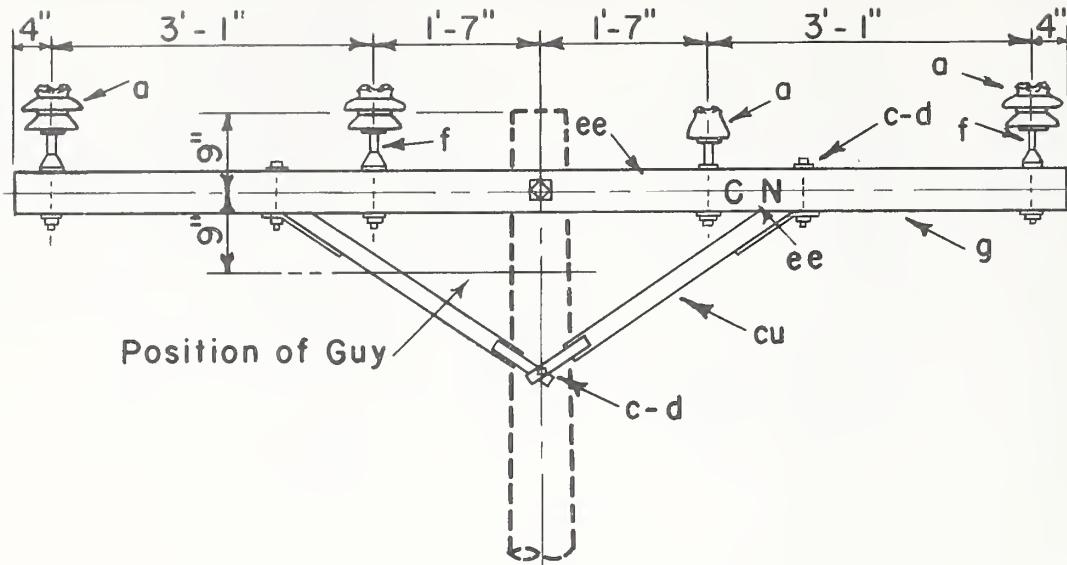


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 2	Insulator, pin type, 12.5 Kv.	g 2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
a 6	Insulator, pin type	n 4	Bolt, double arming, 5/8" x req'd. length
c 4	Bolt, machine, 1/2" x req'd. length	cu 2	Brace, crossarm, wood, 60" span
d 10	Washer, square, 2 1/4"	ee 4	Letters, 2 "C", 2 "N", with 1" nails
d 4	Washer, round, 1 3/8" dia.	ek	Locknuts
f 6	Pin, crossarm, steel, 5/8" x 14"		
f 2	Pin, crossarm, steel, 5/8" x 10 3/4"		

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION- DOUBLE LINE ARM

Jan. 1, 1963

VC9



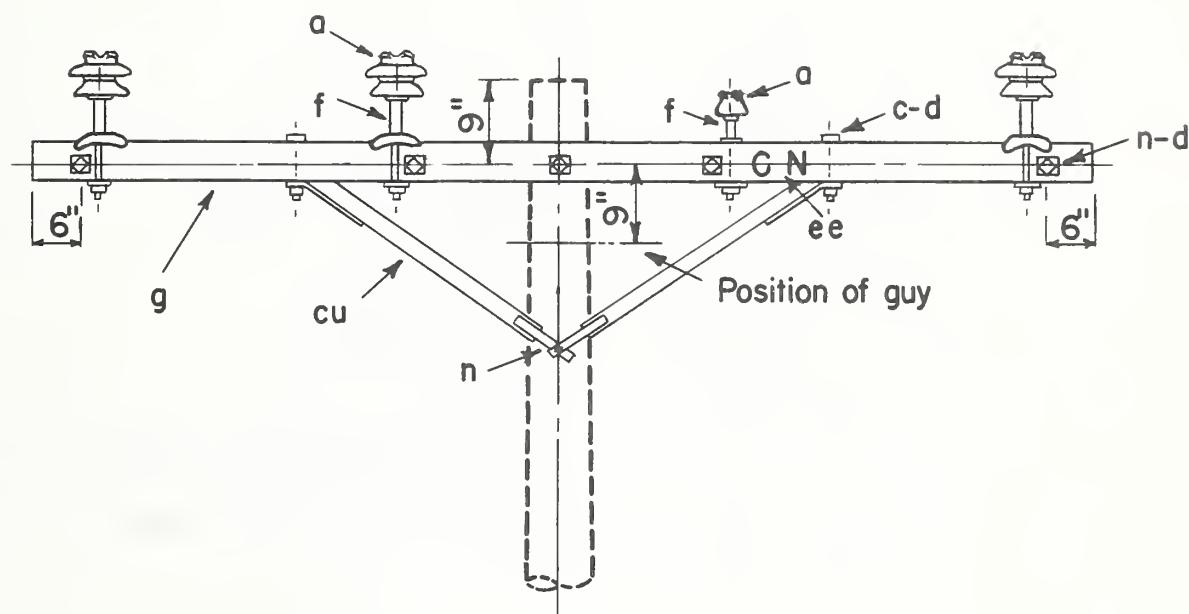
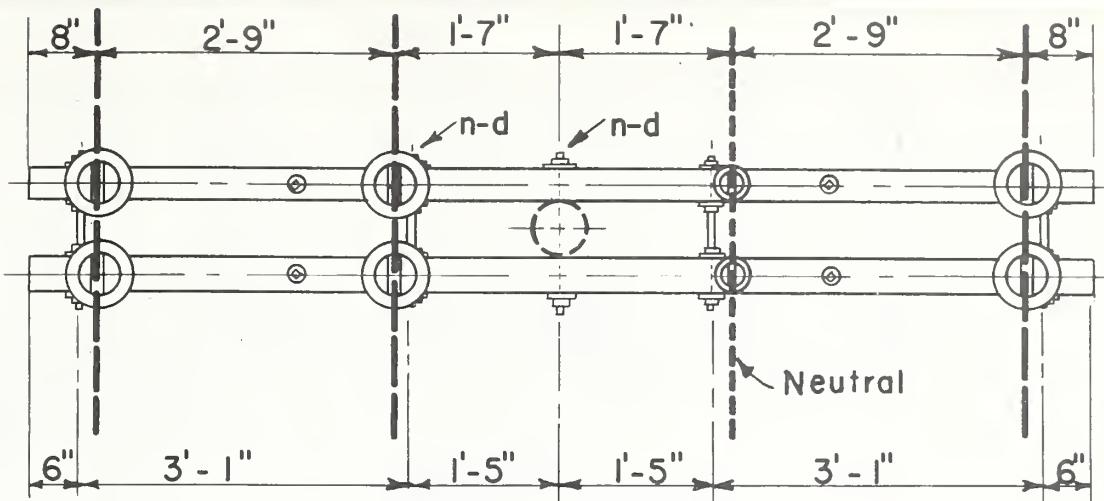
PLAN

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL
a	3	Insulator, pin type		f	3	Pin, crossarm, steel, 5/8" x 14"
a	1	Insulator, pin type, 12.5. Kv.		f	1	Pin, crossarm, steel, 5/8" x 10 3/4"
c	2	Bolt, machine, 5/8" x req'd. length		g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
c	2	Bolt, machine, 1/2" x req'd. length		cu	1	Brace, crossarm, wood, 60" span
d	3	Washer, square, 2 1/4"		ee	4	Letters, 2 "C", 2 "N", with 1" nails
d	2	Washer, round, 1 3/8"		ek		Locknuts

14.4/24.9 KV, 3- PHASE
CROSSARM CONSTRUCTION- SINGLE LINE ARM

Jan. 1, 1963

VC9-1

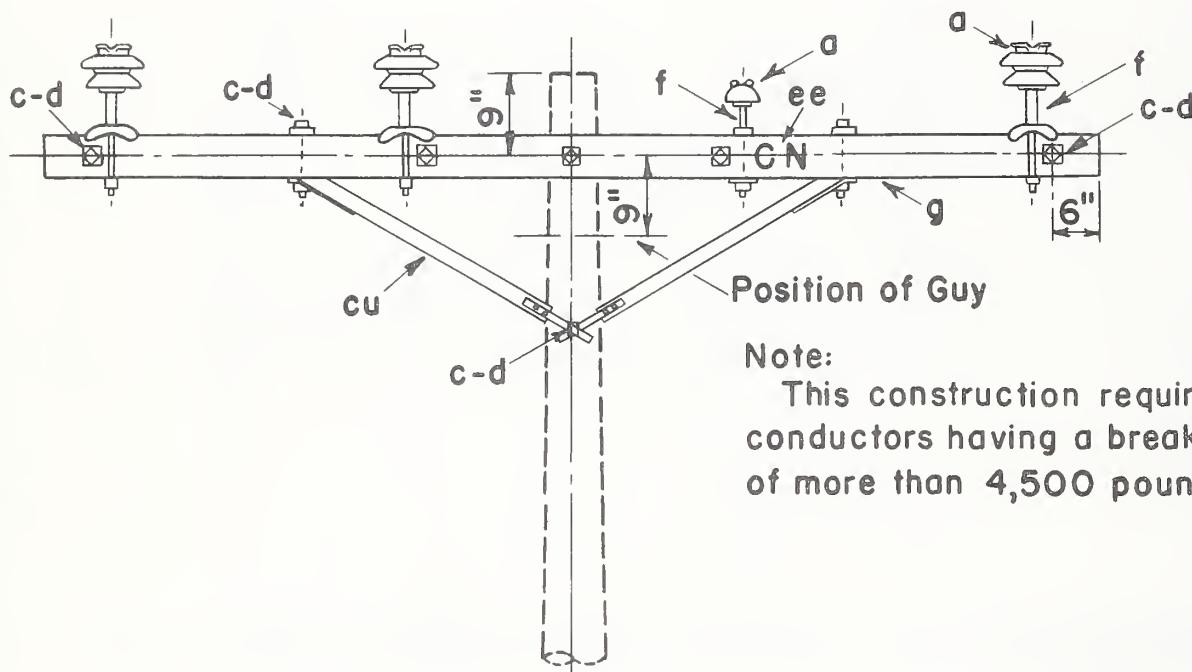
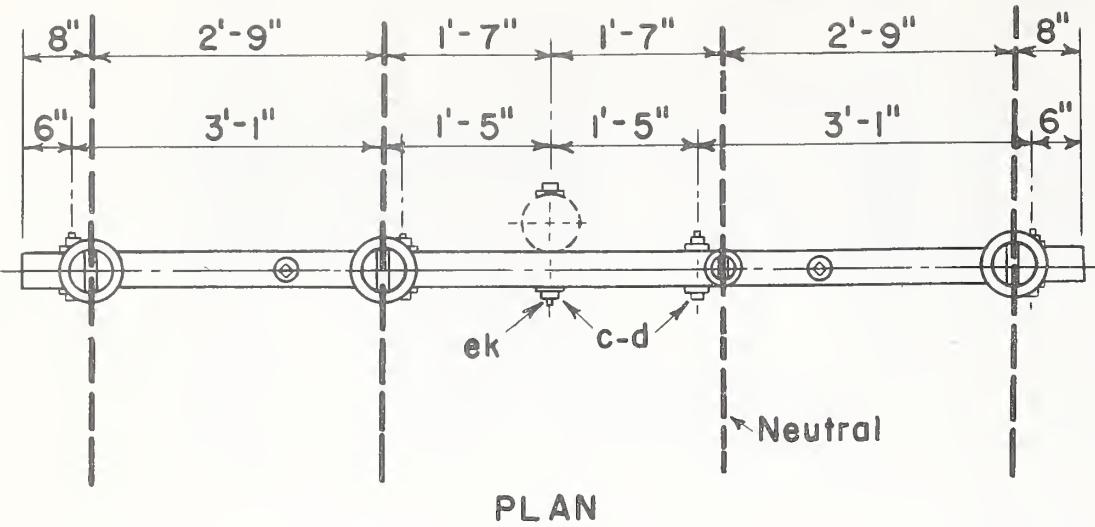


Note:

This construction required for all conductors having a breaking strength of more than 4,500 pounds.

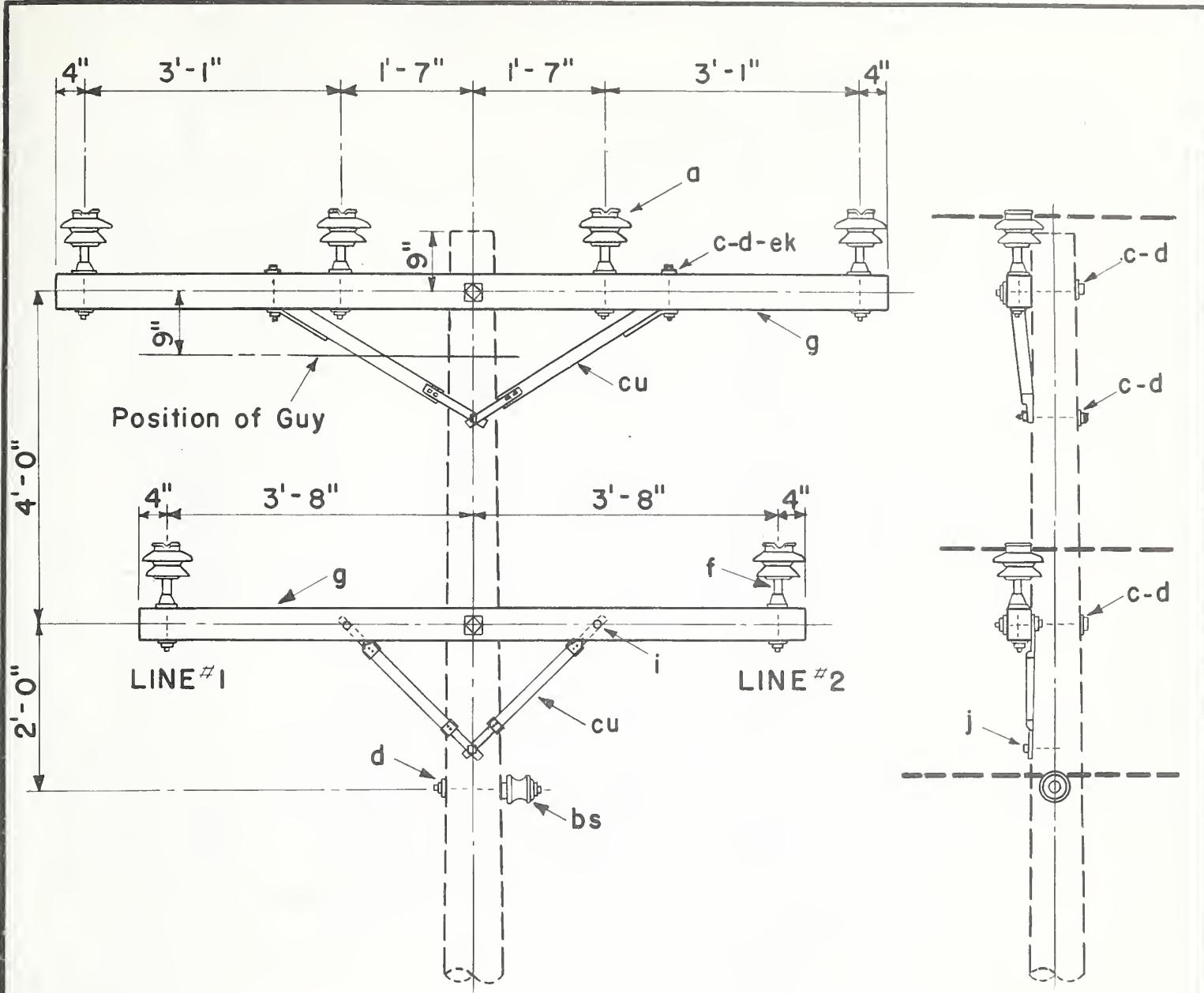
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 6	Insulator, pin type	g 2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
a 2	Insulator, pin type, 12.5 Kv.	n 6	Bolt, double arming, 5/8" x req'd. length
c 4	Bolt, machine, 1/2" x req'd. length	cu 2	Brace, wood, 60" span
d 18	Washer, square, 2 1/4"	ee 4	Letters, 2"C", 2"N", with 1" nails
d 4	Washer, round, 1 3/8"	ek	Locknuts
f 2	Pin, crossarm, steel, 5/8"x 10 3/4"		
f 6	Pin, crossarm, steel, clamp type		

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION- DOUBLE LINE ARM
0° TO 5° ANGLE (LARGE CONDUCTORS)



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 3	Insulator, pin type	f 3	Pin, crossarm, steel, clamp type
a 1	Insulator, pin type, 12.5 KV.	g 1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
c 6	Bolt, machine, 5/8" x req'd length	f 1	Pin, crossarm, steel, 5/8" x 10 3/4"
c 2	Bolt, machine, 1/2" x req'd length	cu 1	Brace, wood, 60" span
d 11	Washer, square 2 1/4"	ek	Locknuts
d 2	Washer, rd., 1 3/8" diam.	ee 4	Letters, 2"C", 2"N" with 1" nails

14.4/24.9 KV., 3-PHASE
CROSSARM CONSTRUCTION-SINGLE LINE ARM
(LARGE CONDUCTORS)



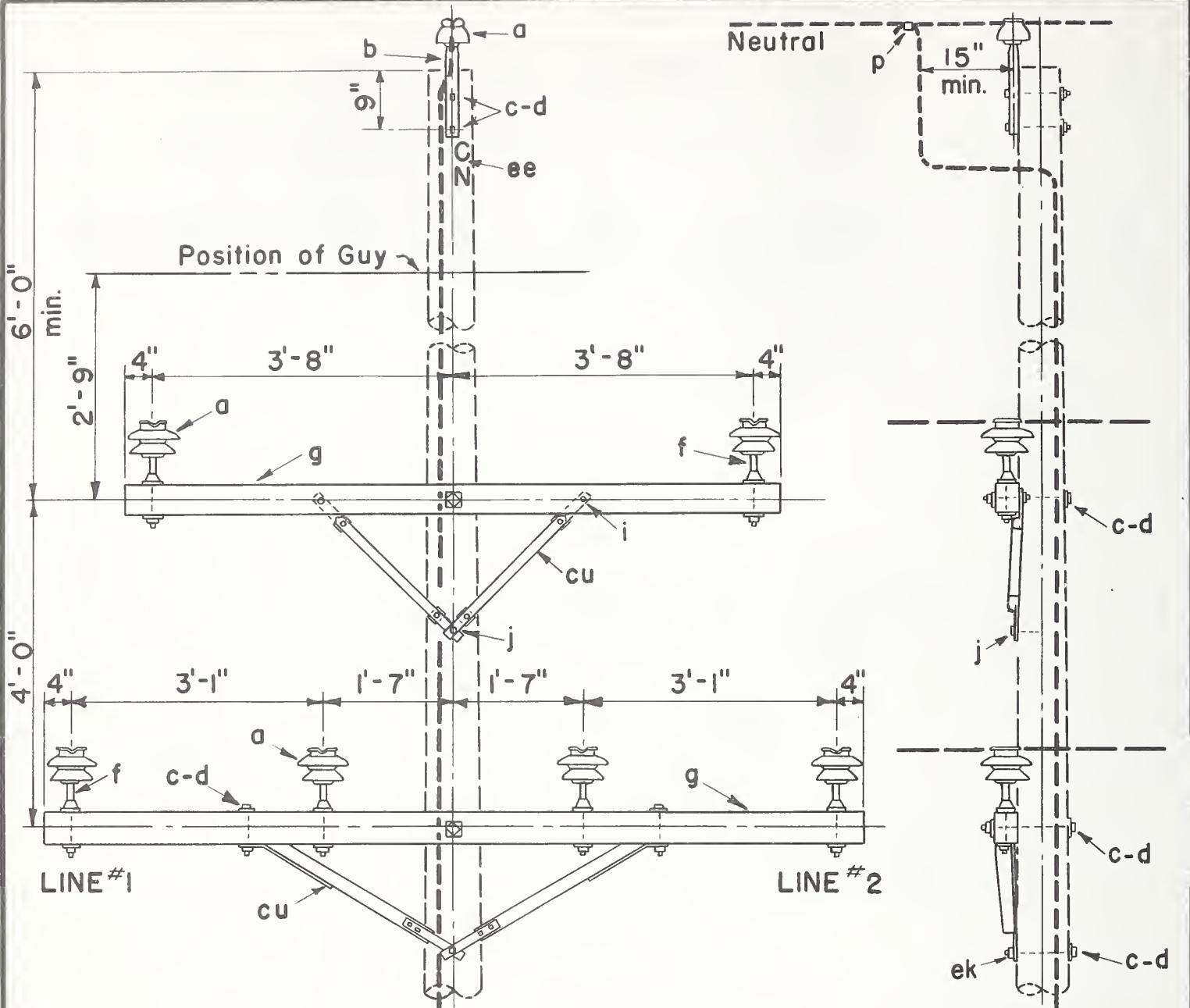
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
a 6	Insulator, pin type	i 2	Bolt, carriage, $\frac{3}{8}$ " x 4 $\frac{1}{2}$ "
c 3	Bolt, machine, $\frac{5}{8}$ " x req'd length	j 1	Screw, lag, $\frac{1}{2}$ " x 4"
c 2	Bolt, machine, $\frac{1}{2}$ " x req'd length	bs 1	Bolt, single upset, insulated
d 6	Washer, square, 2 1/4"	cu 1	Brace, wood, 60" span
d 2	Washer, $1\frac{3}{8}$ " diam.	ek	Locknuts
f 6	Pin, crossarm, steel, $\frac{5}{8}$ " x 14"	g 1	Crossarm, $3\frac{1}{2}$ " x 4 $\frac{1}{2}$ " x 8'-0"
g 1	Crossarm, $3\frac{3}{4}$ " x $4\frac{3}{4}$ " x 10'-0"		
cu 2	Brace, wood, 28"		

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DOUBLE CIRCUIT
SINGLE PRIMARY SUPPORT AT 0° TO 5° ANGLE

Jan. 1, 1963

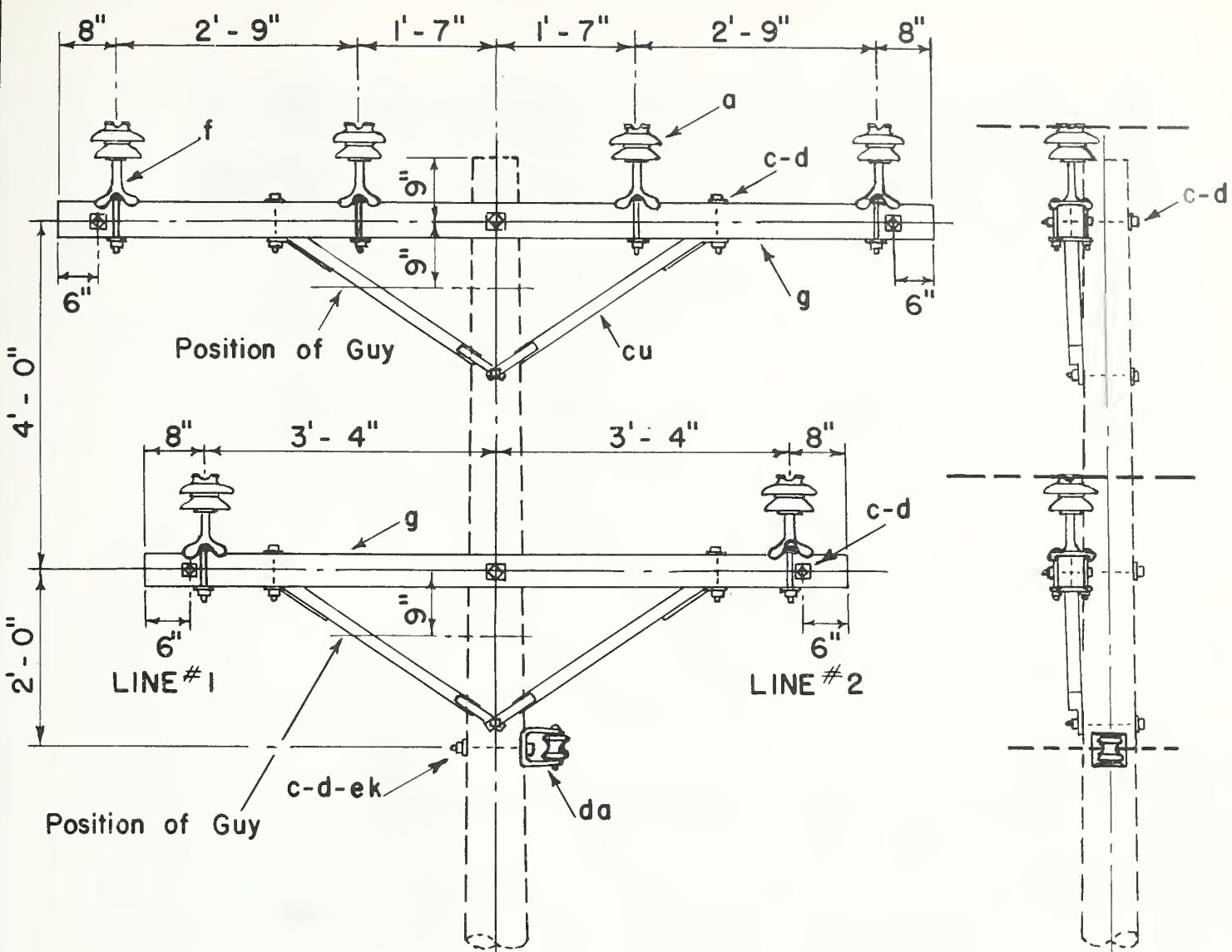
2 X - ARM TYPE

VDC-CI



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	g	1	Crossarm, $3\frac{3}{4}'' \times 4\frac{3}{4}'' \times 10'-0''$
a	1	Insulator, pin type, 12.5 KV.	g	1	Crossarm, $3\frac{1}{2}'' \times 4\frac{1}{2}'' \times 8'-0''$
b	1	Pin, pole top	i	2	Bolt, carriage, $\frac{3}{8}'' \times 4\frac{1}{2}''$
c	5	Bolt, machine, $\frac{5}{8}'' \times \text{req'd length}$	j	1	Screw, lag, $\frac{1}{2}'' \times 4''$
c	2	Bolt, machine, $\frac{1}{2}'' \times \text{req'd length}$	p		Connectors, as required
d	7	Washer, square $2\frac{1}{4}''$	cu	2	Brace, wood, 28"
d	2	Washer, rd, $1\frac{3}{8}''$ dia.	cu	1	Brace, wood, 60" span
f	6	Pin, crossarm, steel, $\frac{5}{8}'' \times 14''$	ee	4	Letters, 2"C", 2"N" with 1" nails
ek		Locknuts			

14.4/24.9 KV, 3-PHASE
 CROSSARM CONSTRUCTION - DOUBLE CIRCUIT
 SINGLE PRIMARY SUPPORT WITH OVERHEAD NEUTRAL
 AT 0° TO 5° ANGLE

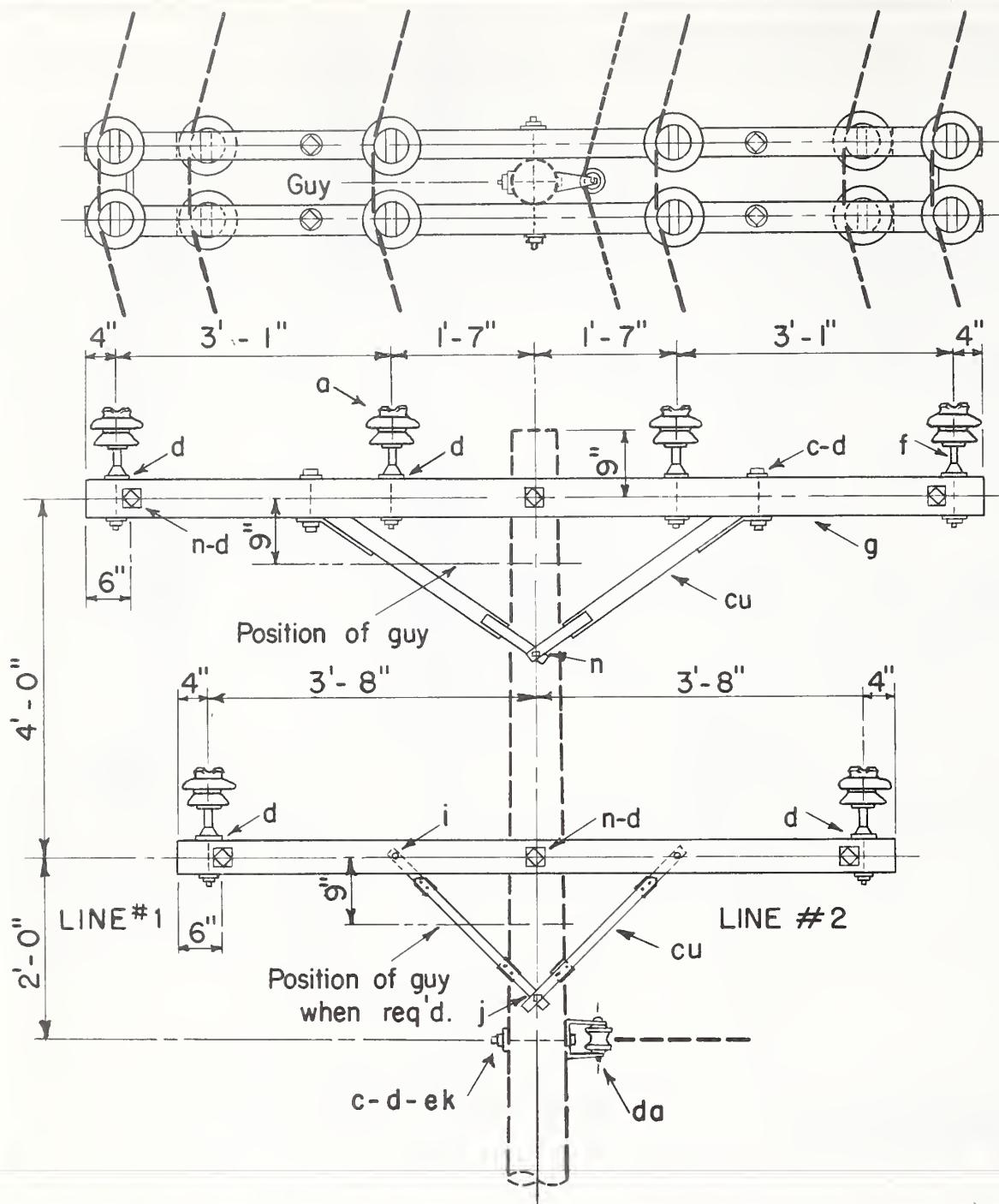


Note:

This construction required for all conductors having a breaking strength of more than 4500 pounds.

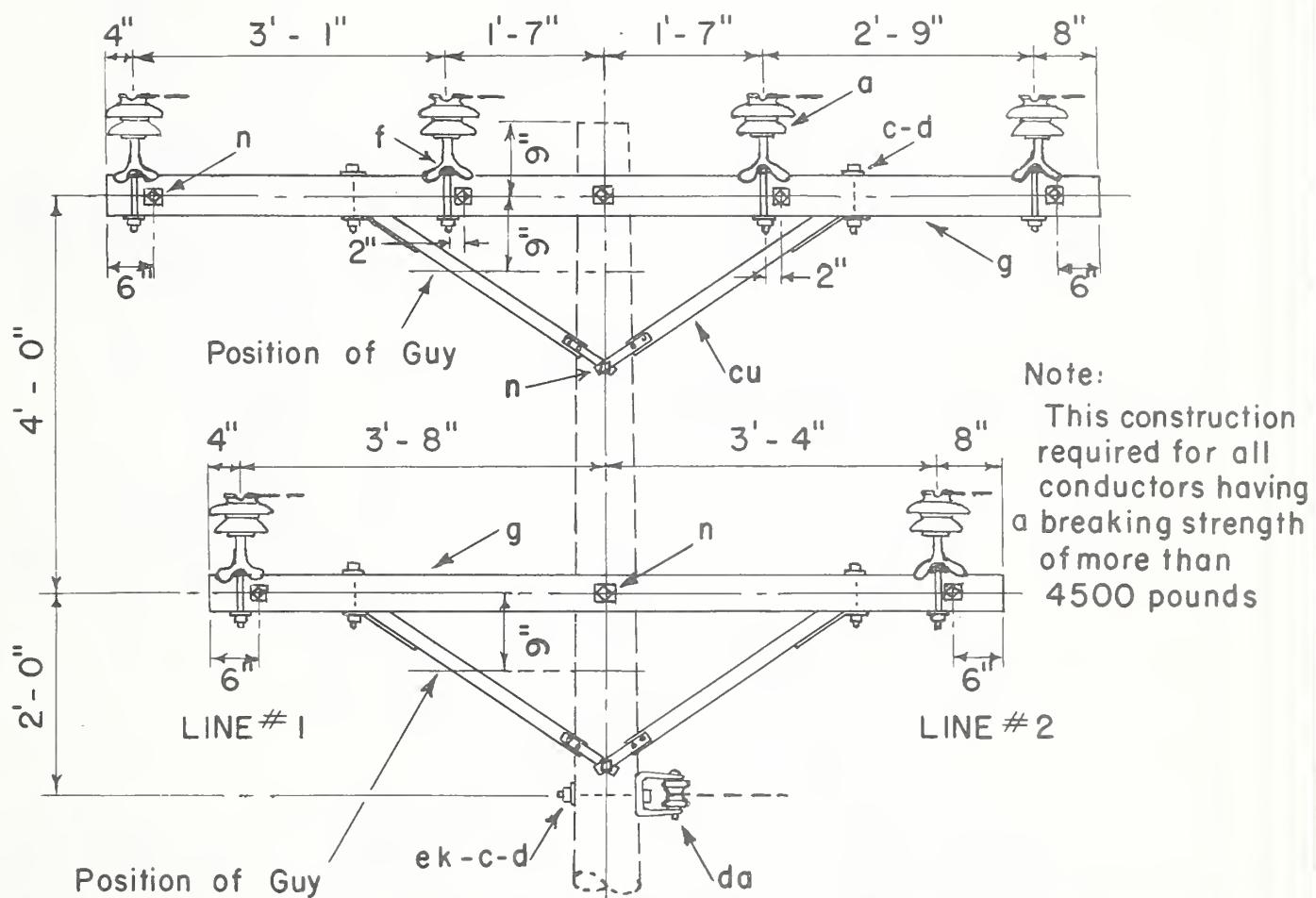
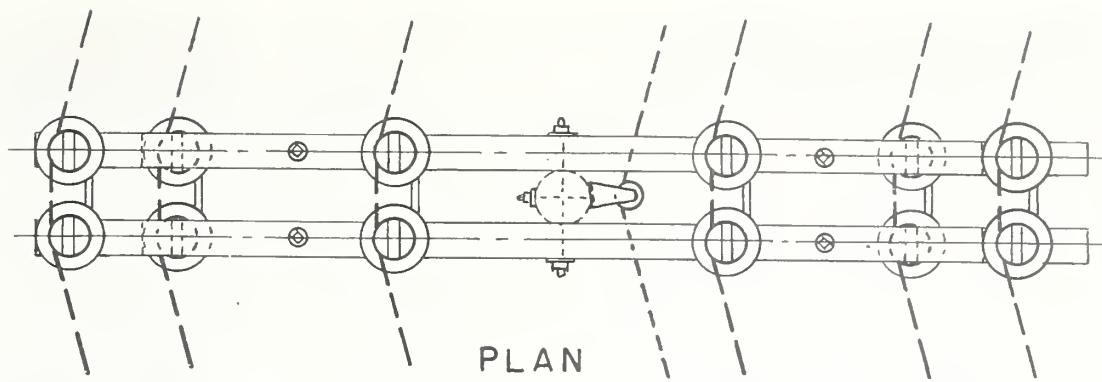
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	6	Insulator, pin type	g	1	Crossarm, 3 3/4" x 4 3/4" x 8'-0"
c	9	Bolt, machine, 5/8" x req'd. length	cu	2	Brace, wood, 60" span
c	4	Bolt, machine, 1/2" x req'd. length	da	1	Bracket, insulated
d	15	Washer, square, 2 1/4"	ek		Locknuts
d	4	Washer, round, 1 3/8" diam.			
f	6	Pin, crossarm, steel, clamp type			
g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"			

14.4 / 249 KV 3-PHASE CROSSARM CONSTRUCTION
DOUBLE CIRCUIT
(LARGE CONDUCTORS)
0° TO 5° ANGLE



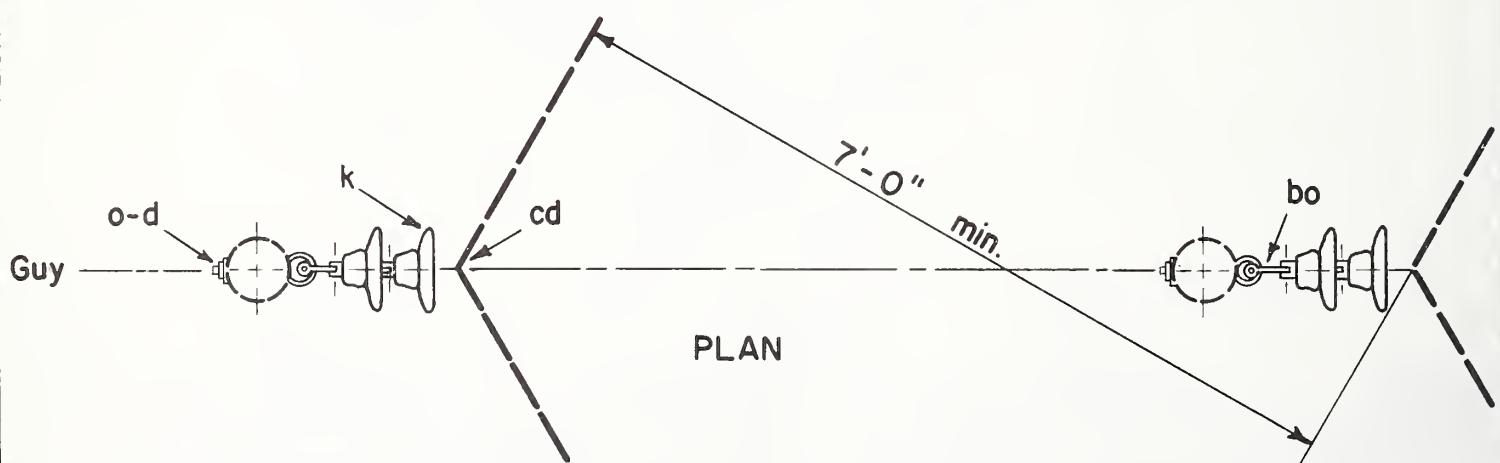
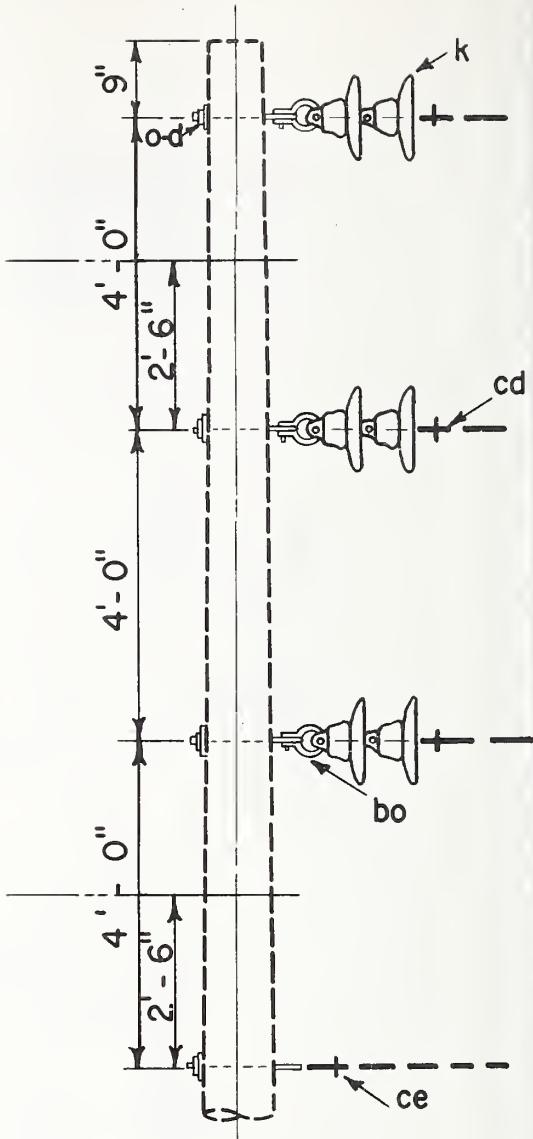
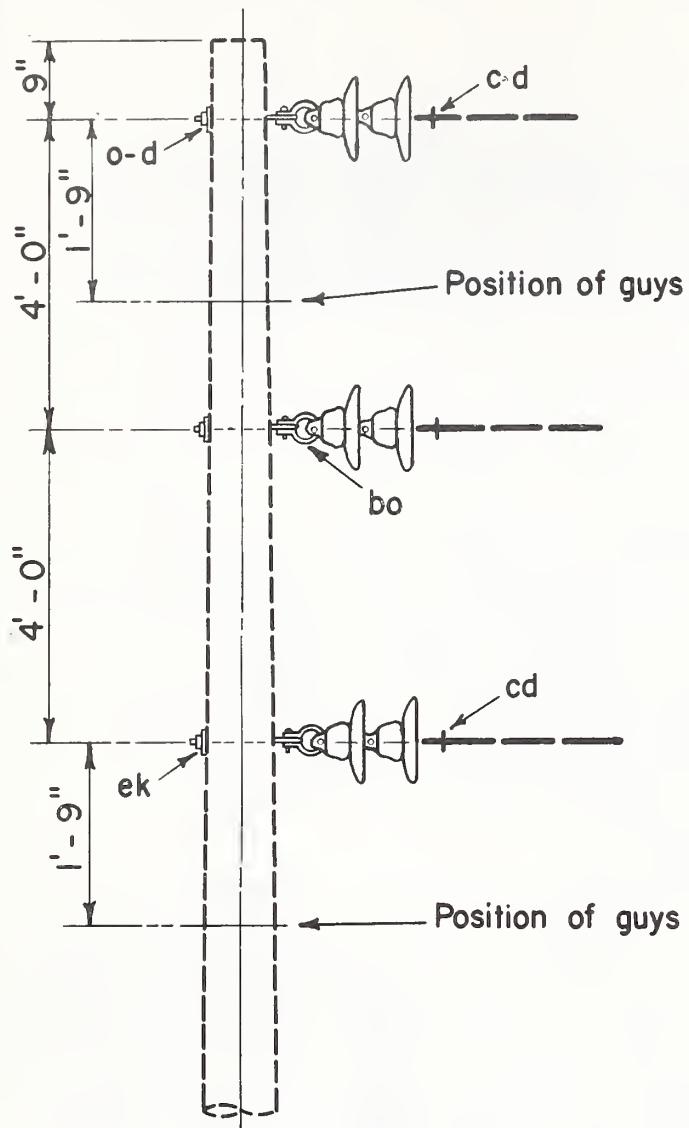
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	12	Insulator, pin type	g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
c	1	Bolt, machine, 5/8" x req'd. length	cu	4	Brace, wood 28"
c	4	Bolt, machine, 1/2" x req'd. length	i	4	Bolt, carriage, 3/8" x 4 1/2"
d	21	Washer, square, 2 1/4"	j	2	Screw, lag, 1/2" x 4"
d	4	Washer, round, 1 3/8"	n	7	Bolt, double arming, 5/8" x req'd. length
d	12	Washer, square 3"	cu	2	Brace, wood, 60" span
f	12	Pin, crossarm, steel, 5/8" x 14"	da	1	Bracket, insulated
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	ek		Locknuts

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION - DOUBLE CIRCUIT
5° TO 30° ANGLE



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
a	12	Insulator, pin type	9	2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"
c	1	Bolt, machine, 5/8" x req'd. length	n	10	Bolt, double arming, 5/8" x req'd. lgth.
c	8	Bolt, machine, 1/2" x req'd. length	cu	4	Brace, wood, 60" span
d	29	Washer, square, 2 1/4"	da	1	Bracket, insulated
d	8	Washer, round, 1 3/8" diam.	ek		Locknuts
f	12	Pin, crossarm, steel, clamp type			
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"			

14.4/249 KV 3-PHASE CROSSARM CONSTRUCTION
DOUBLE CIRCUIT (LARGE CONDUCTORS)
MAX. TRANSVERSE LOADING 1000 LBS./PIN
5° TO 30° MAXIMUM ANGLE

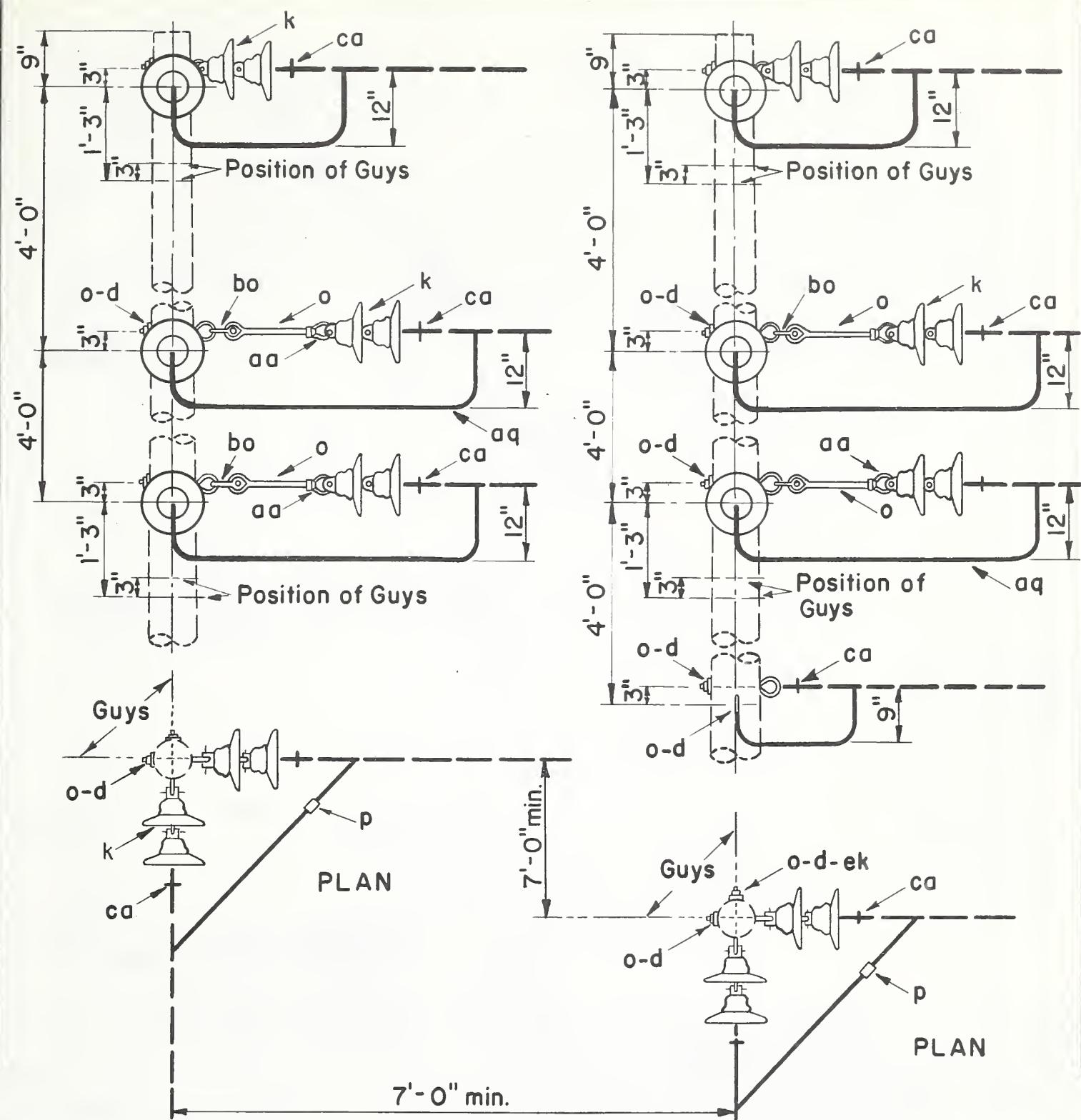


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 6	Washer, square, 2 1/4"	cd 6	Angle assembly, primary
k 12	Insulator, suspension, 10"	ce 1	Angle assembly, neutral
o 6	Bolt, eye, 5/8" x req'd. length	ek	Locknuts
bo 6	Shackle, anchor		

14.4/24.9 KV, 3- PHASE
VERTICAL CONSTRUCTION- DOUBLE CIRCUIT
30° TO 60° ANGLE

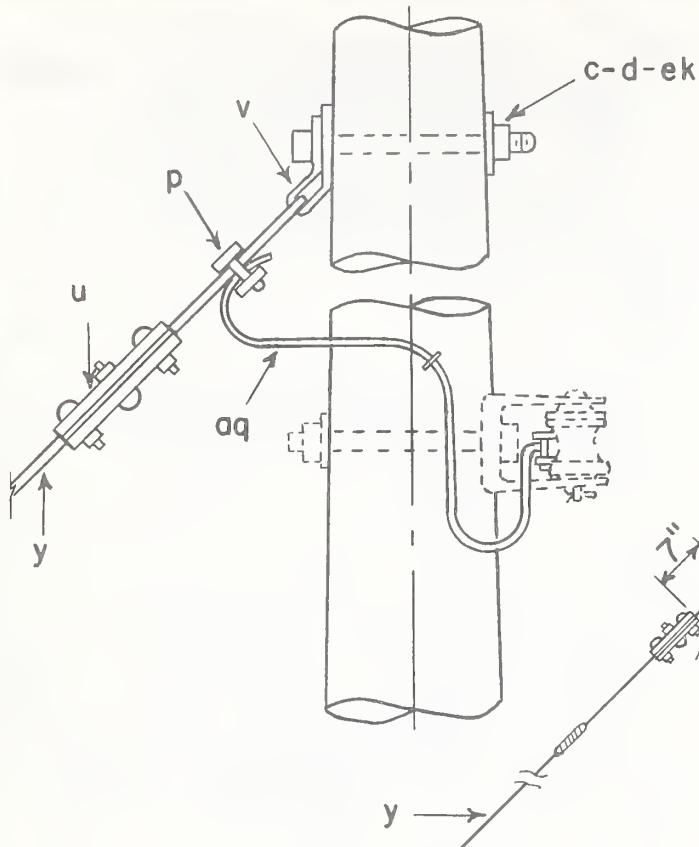
Jan. 1, 1963

VDC-C3

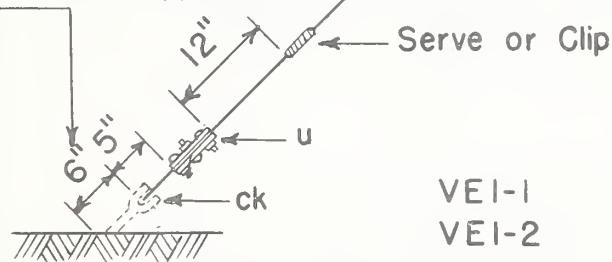


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
d 14	Washer, $2\frac{1}{4}'' \times 2\frac{1}{4}'' \times \frac{3}{16}''$, $1\frac{3}{16}''$ hole	bo 8	Shackle, anchor
k 24	Insulator, suspension, 10"	ca 12	Deadend assembly, primary
o 22	Bolt, eye, $\frac{5}{8}''$ x req'd length	cc 2	Deadend assembly, neutral
p	Connectors, as required	ek	Locknuts
aa 8	Nut, eye, $\frac{5}{8}''$		
aq	Jumpers, as required		

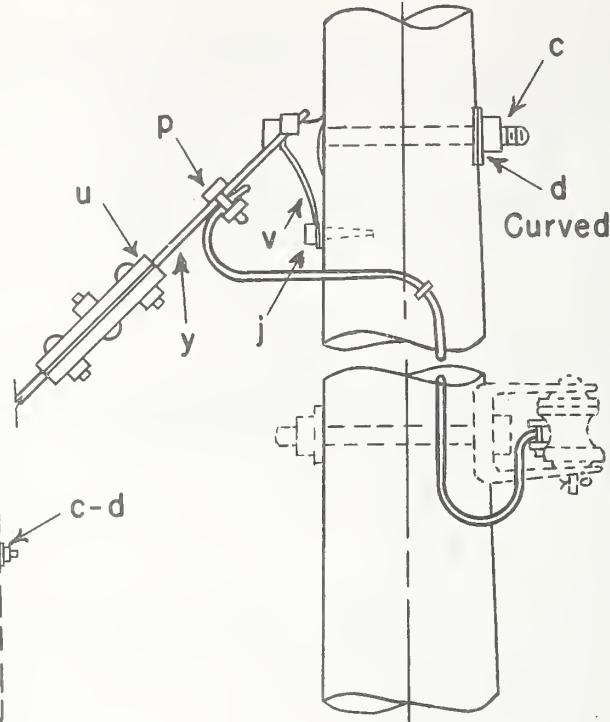
14.4/24.9 KV, 3-PHASE, DOUBLE CIRCUIT
VERTICAL CONSTRUCTION 60° TO 90° ANGLE



Maximum after strain is applied

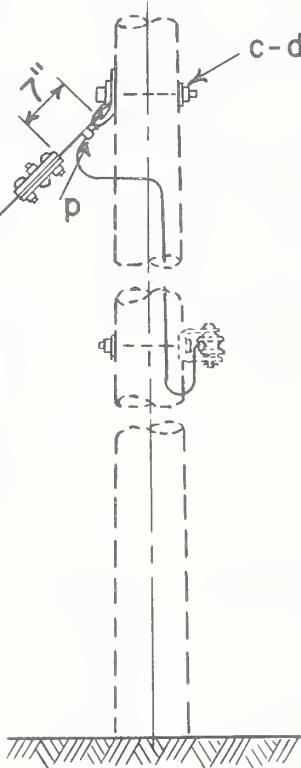


VEI-1
VEI-2



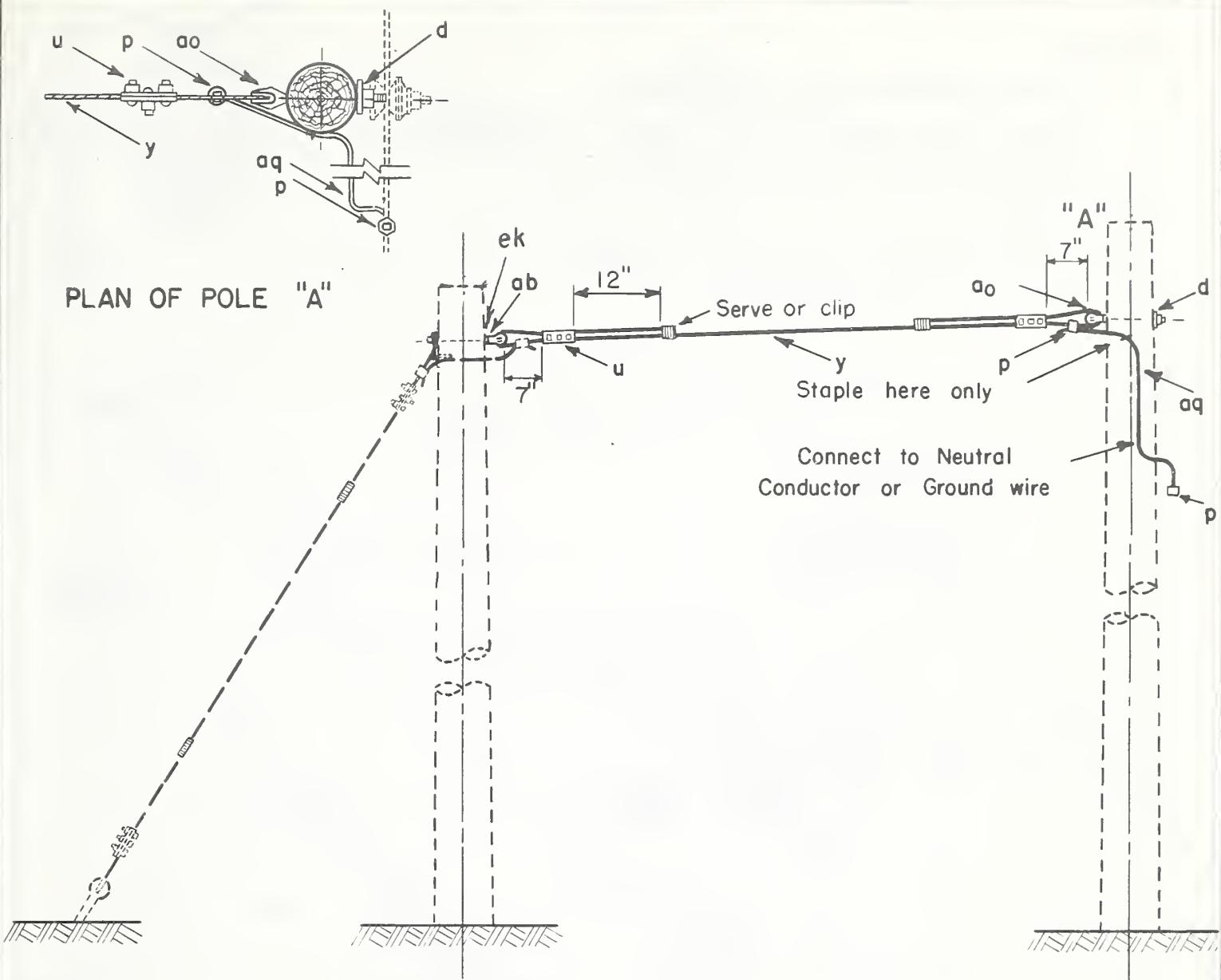
VEI-3

This may be substituted
for wrapped type guy.



ITEM	MATERIAL	ASSEMBLY UNIT		
		VEI-1 1/4" Guy Wire	VEI-2 3/8" Guy Wire	VEI-3 7/16" Guy Wire
c	Bolt, machine, 5/8"x required length	1	1	1
d	Washer, square, 2 1/4"	1	1	
d	Washer, curved, 3"x 3"			1
j	Screw, lag, 1/2" x 4"			1
p	Connectors, as required			
u	Deadend for guy strand	2-Medium Duty	2-Medium Duty	2-Heavy Duty
v	Guy attachment	1	1	1-Heavy Duty
y	Guy wire, S.M., 7 Strand	req'd. length	req'd. length	req'd. length
ck	Clamp, anchor rod bonding	1	1	1
aq	Jumper, #6 S. D. Copper equivalent	1	1	1
ek	Locknuts			

14.4/24.9 KV.
SINGLE DOWN GUY, THROUGH BOLT TYPE



Note:

Other accepted and equivalent items of deadend material may be substituted for the 3-bolt clamp shown.

ASSEMBLY UNIT				
	E2-1 1/4" GUY WIRE	E2-2 3/8" GUY WIRE	E2-3 7/16" GUY WIRE	
ITEM	MATERIAL	NO. REQ'D.	NO. REQ'D.	NO. REQ'D.
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole	1		
d	Washer, curved, 3" x 3" x 5/16", 11/16" hole		1	1
u	Deadend for guy strand	2-Medium Duty req'd. length	2-Heavy Duty req'd. length	2-Heavy Duty req'd. length
y	Guy wire, S.M., 7-strand			
ab	Nut, thimble type eye, 5/8"	1	1	1
ao	Bolt, thimbleye, 5/8" x req'd. length	1	1	1
aq	Jumper, "6 S.D. or equivalent	1	1	1
p	Connectors, as req'd.			
ek	Locknuts			

7.2/12.5 KV

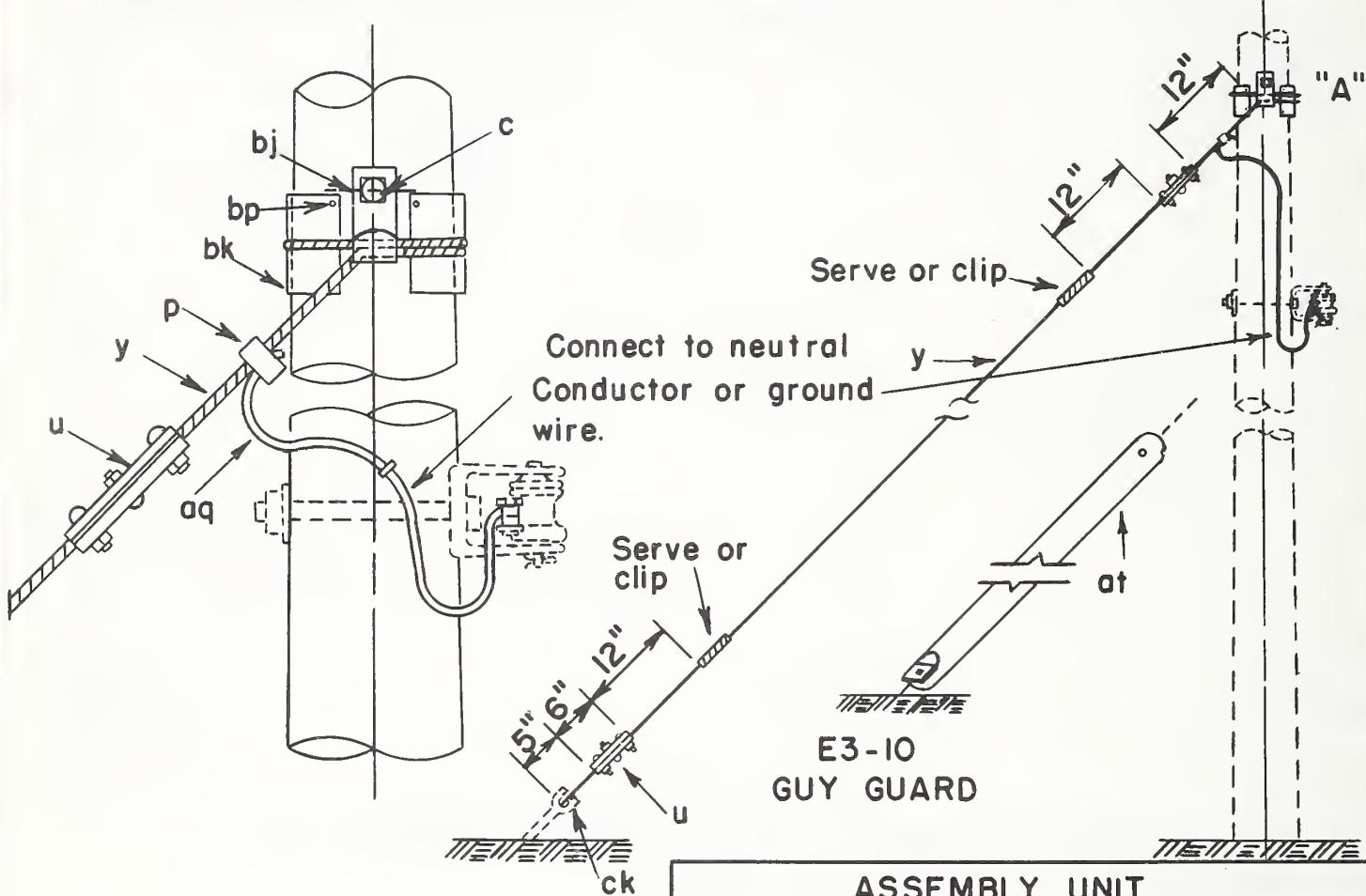
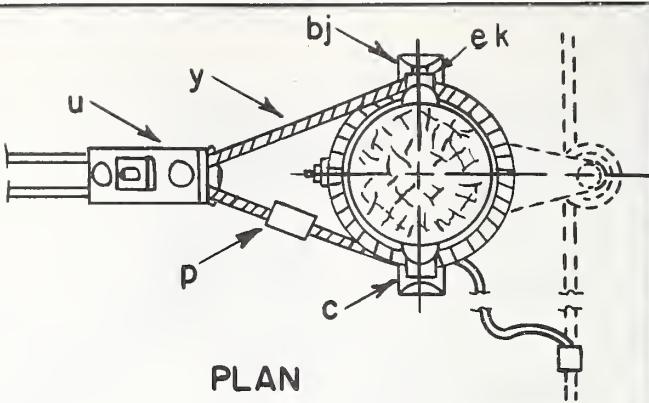
SINGLE OVERHEAD GUY, THROUGH BOLT TYPE

Jan 1, 1962

E2-1, E2-2, E2-3

NOTES:

- I. Other accepted and equivalent (item u) guy clamps may be substituted for the 3-bolt clamps shown.
2. Assemblies E1-2 and E1-3 (throughbolt type) are preferred units.

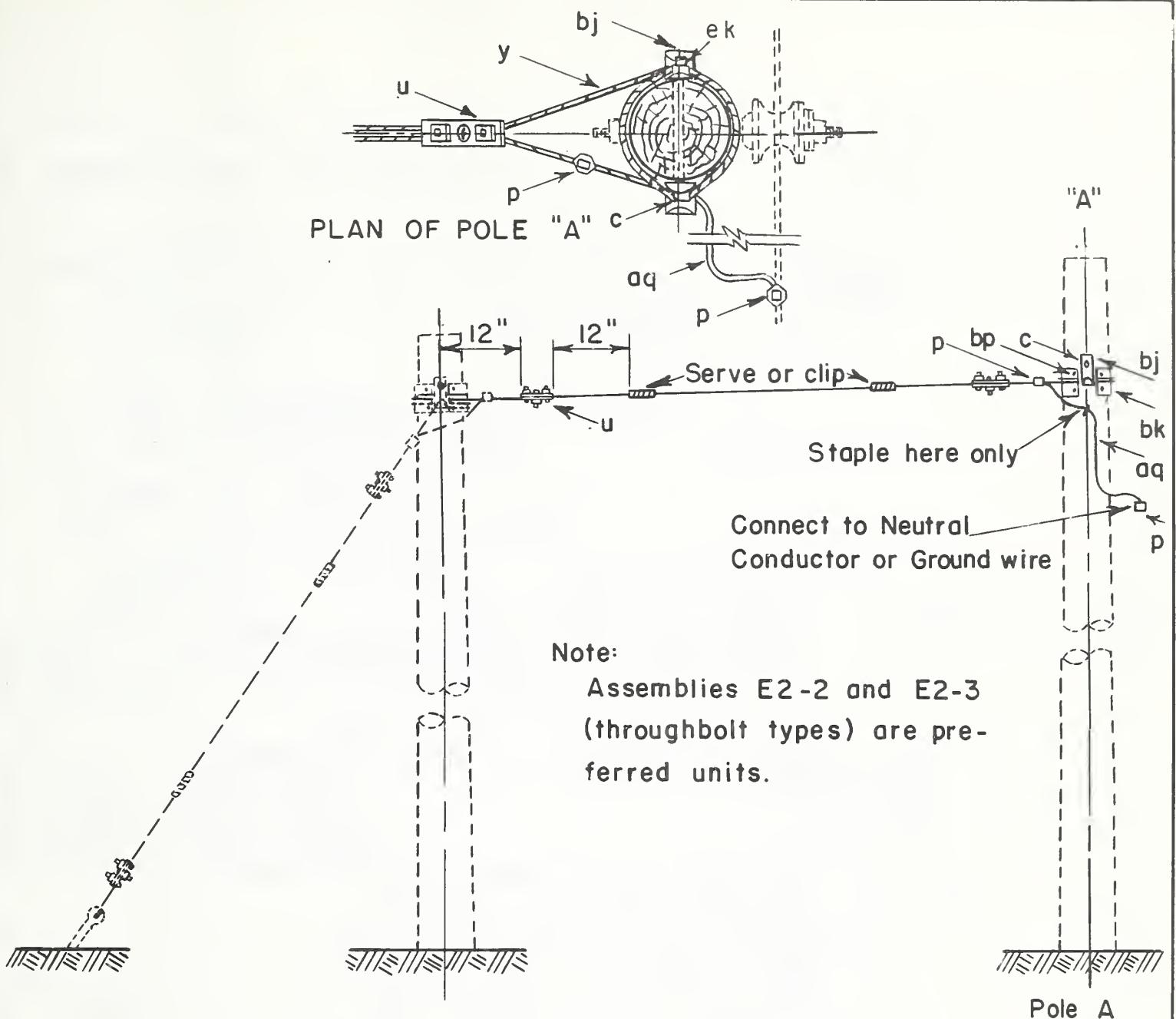


ASSEMBLY UNIT

ITEM	MATERIAL	ASSEMBLY UNIT		
		E3-2 3/8" Guy Wire	E3-3 7/16" Guy Wire	E3-10 Guy Guard
c	Bolt, machine, 5/8" x req'd length	1	1	
p	Connectors, as req'd			
u	Clamp, guy, 3-bolt, 6" long	2-Medium Duty	2-Heavy Duty	
y	Guy Wire, S-M, 7-strand	req'd length	req'd length	
aq	Jumper, #6 S. D. copper or equiv.			
at	Guy guard, 8' min. length			1
bj	Guy Hook, J	2	2	
bk	Guy Plate, 4" x 8", 14 gauge	2	2	
bp	Nail, 8 penny, galv.	8	8	
ck	Clamp, anchor rod bonding	1	1	
ek	Locknuts			

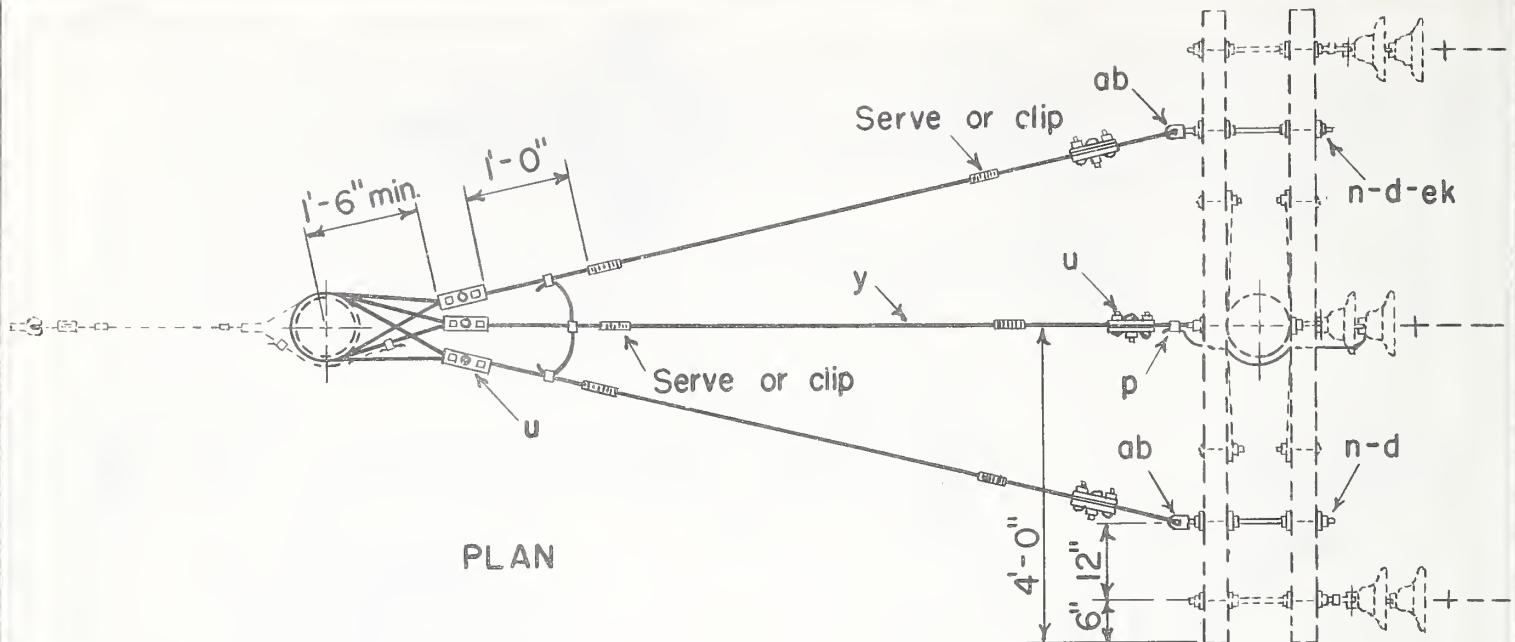
7.2/12.5 KV.

SINGLE DOWN GUY, WRAPPED TYPE



ASSEMBLY UNIT			
	E4-2 3/8" Guy Wire	E4-3 7/16" Guy Wire	
ITEM	MATERIAL	No. REQ'D	No. REQ'D
c	Bolt, machine, 5/8" x req'd length	1	1
p	Connectors, as req'd		
u	Deadend for guy strand	2-Medium Duty	2-Heavy Duty
y	Guy Wire, S-M, 7-strand	req'd length	req'd length
aq	Jumper, #6 S.D. or equivalent	1	1
bj	Guy Hook,J	2	2
bk	Guy Plate, 4"x8", 14 gauge	2	2
bp	Nail, 8 penny, galv.	8	8
ek	Locknuts		

7.2 / 12.5 KV.	
SINGLE OVERHEAD GUY, WRAPPED TYPE	
Jan 1, 1962	E 4-2, E 4-3

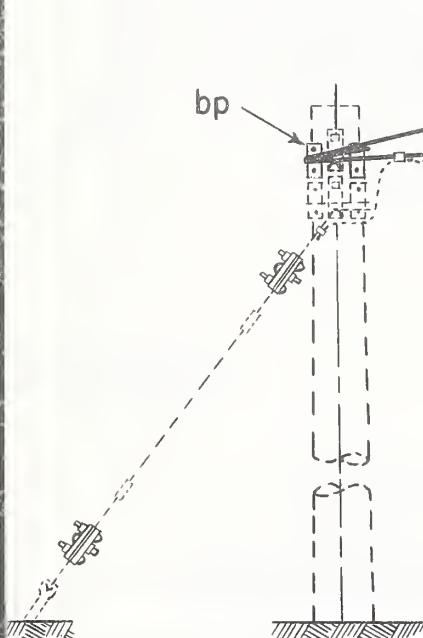


PLAN

Note:

For conductors having a breaking strength of more than 4,500 pounds reduce to 10° maximum

VE5-1	1/4" Strand
VE5-2	3/8" Strand



Note:

This type guy to be used for crossarm construction where the unbalanced loaded tension is more than 1000 lbs. per conductor for 8 foot crossarms, 2000 lbs. for 5'-7" crossarms and 3000 lbs. for 4 foot crossarms. When a third crossarm is added as shown on drawing VC7-1, these loads may be increased by fifty percent.

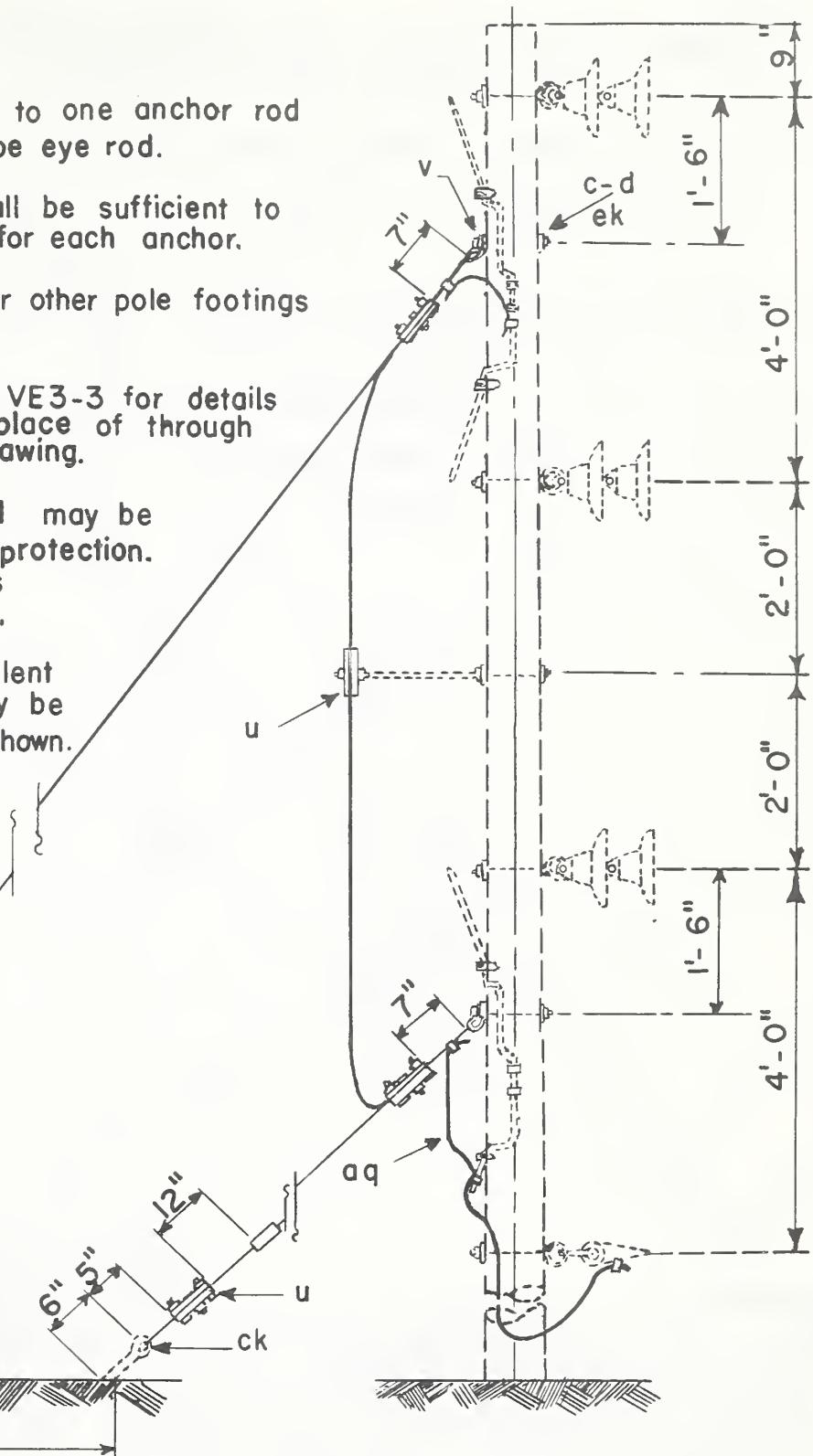
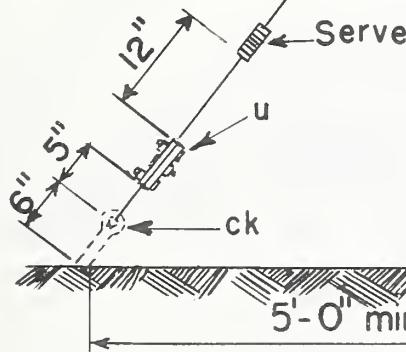
ITEM	No.	MATERIAL	ITEM	No.	MATERIAL
c	1	Bolt, machine, 5/8" x required length	al	1	Staple, ground wire
d	9	Washer, square, 2 1/4"	ao	1	Bolt, thimble type eye, 5/8" x req'd lg.
n	2	Bolt, double arming, 5/8" x req'd. lg.	aq		Jumper, #6 S.D. or equivalent
p		Connectors, as required	bj	2	Guy Hook, J
u	6	Deadend for guy strand	bk	2	Guy Plate, 4"x8", 14 gauge
y		Wire, guy, S.M. 7 strand, as req'd.	bp	8	Nail, 8 penny, gal.
ab	2	Nut, thimble type eye, 5/8"	ek		Locknuts

14.4/24.9 KV.
DEADEND GUY
CROSSARM CONSTRUCTION

NOTES:

1. When two guys are attached to one anchor rod use 3/4" x 8'-0" twin thimble type eye rod.
2. Spacing between anchors shall be sufficient to provide maximum holding power for each anchor.
3. For loose soils, concrete or other pole footings are recommended.
4. Refer to Dwgs. VE3-2 and VE3-3 for details of Wrapped guy when used in place of through bolt type guy shown in this drawing.
5. Arcing horns shown dotted may be installed as required for pole protection. For details of arcing horns refer to drawing VMIO-14.
6. Other accepted and equivalent item "u" deadend material may be substituted for 3-bolt clamps shown.

VE6-2	3/8" Strand
VE6-3	7/16" Strand

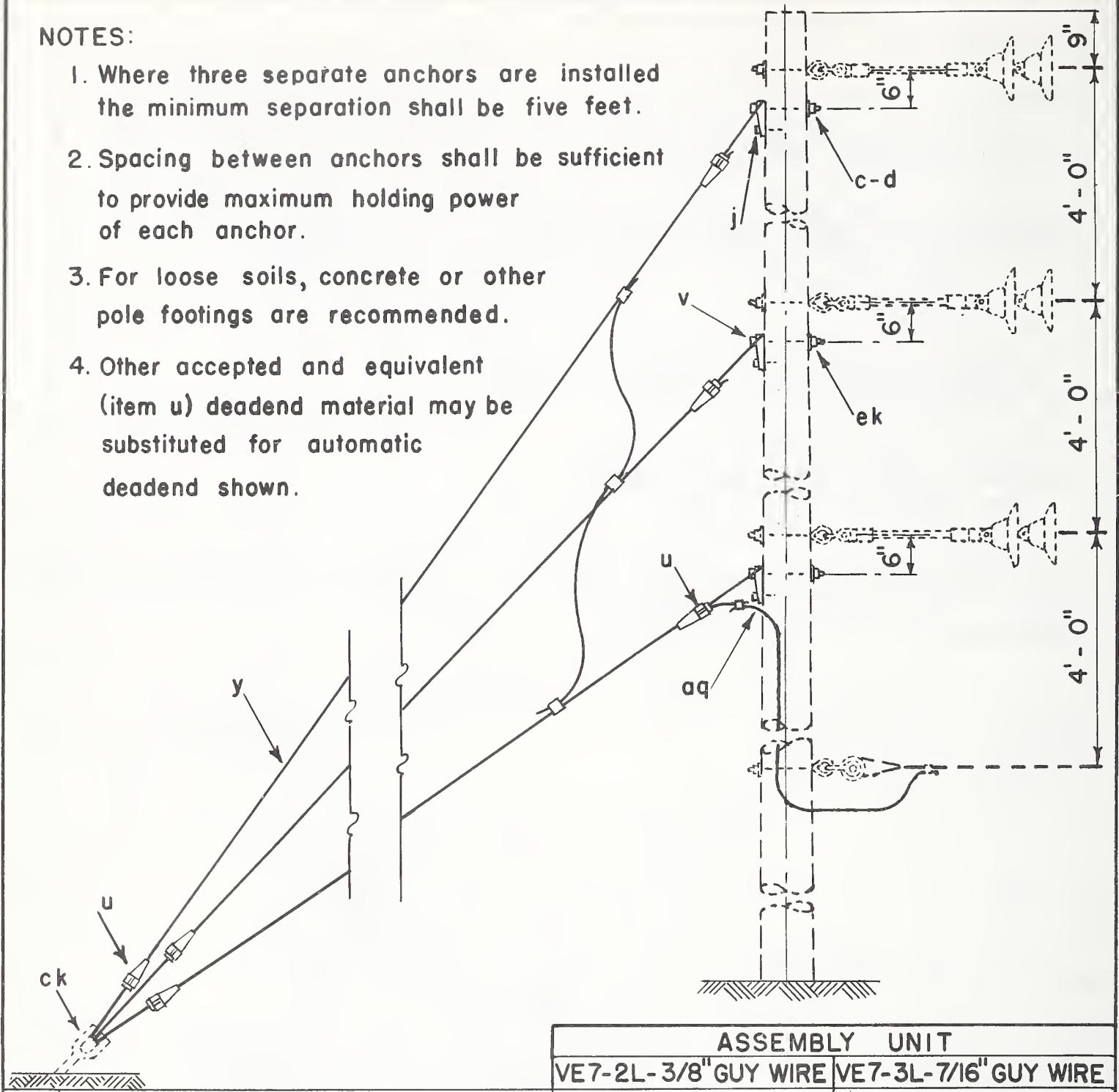


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 2	Bolt, machine, 5/8"x req'd. length	y	Guy wire, S-M., 7-strand
d 2	Washer, square 2 1/4"	ck	Clamp, guy bond, as required
u 5	Deadend for guy strand	p	Connectors, as req'd.
v 2	Guy attachment	aq	Jumpers or leads, as req'd.
ek	Locknuts		

14.4 / 24.9 KV
DOUBLE DOWN GUY

NOTES:

1. Where three separate anchors are installed the minimum separation shall be five feet.
2. Spacing between anchors shall be sufficient to provide maximum holding power of each anchor.
3. For loose soils, concrete or other pole footings are recommended.
4. Other accepted and equivalent (item u) deadend material may be substituted for automatic deadend shown.



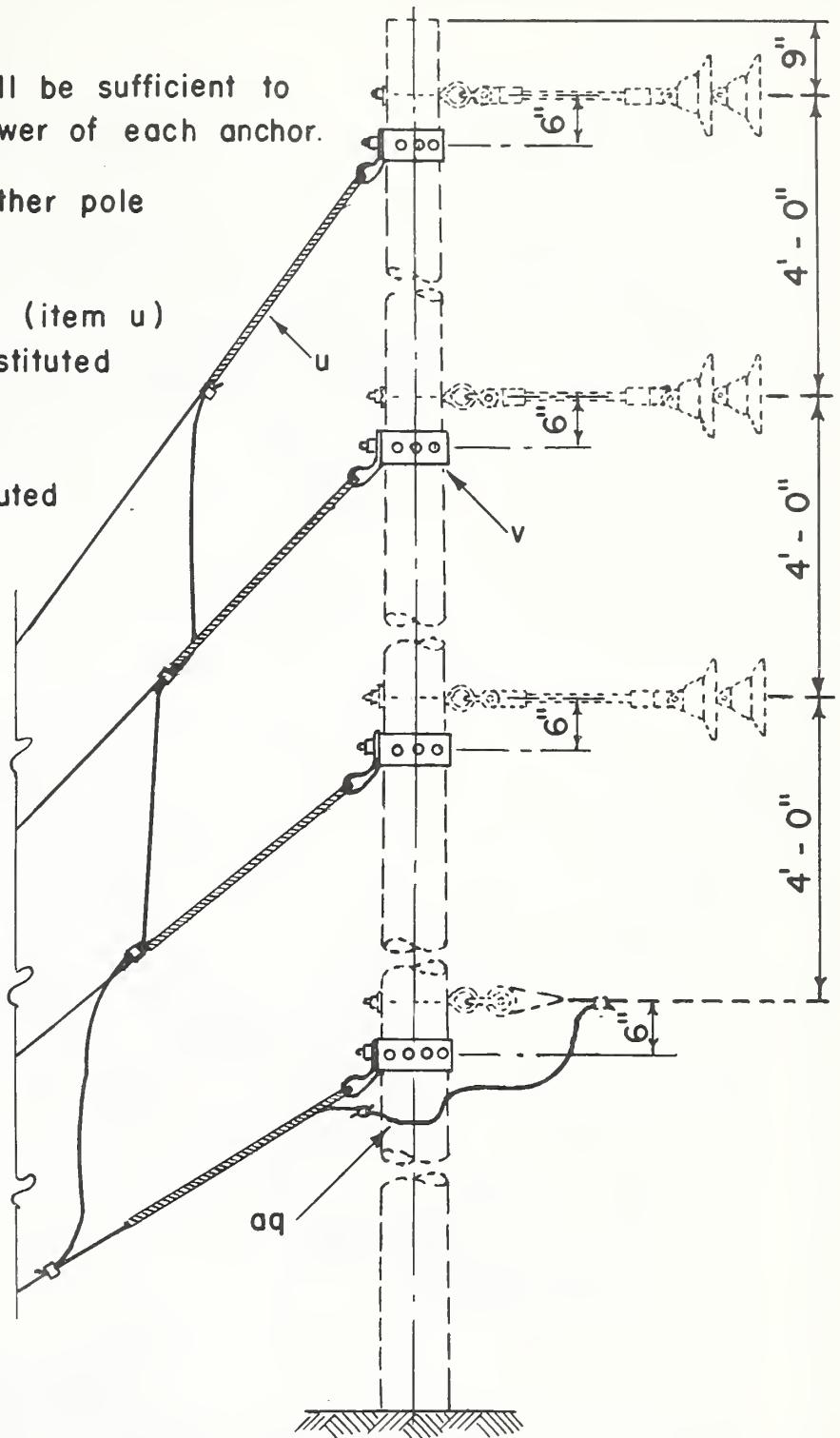
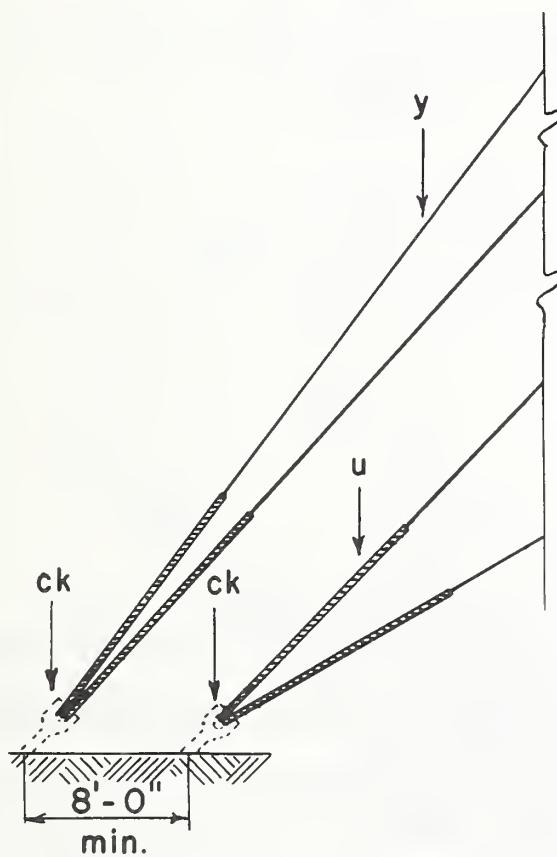
ASSEMBLY UNIT	
VE7-2L-3/8" GUY WIRE	VE7-3L-7/16" GUY WIRE

ITEM	MATERIAL	No. Required	No. Required
c	Bolt, machine, 5/8" x required length	3	3
d	Washer, curved, 3" x 3" x 5/16"		3
d	Washer, square, 2 1/4"	3	
j	Screw, lag, 1/2" x 4"	3	3
p	Connectors, as required		
u	Deadend for guy strand	6	6
v	Guy attachment, Mail. Iron, Heavy Duty	3	3
y	Guy wire, S.M., 7-Strand, as required	required length	required length
aq	Jumpers, as required		
ck	Clamp, guy bonding, as required		
ek	Locknuts		

14.4/24.9 KV- THREE DOWN GUYS
(LARGE CONDUCTORS)

NOTES:

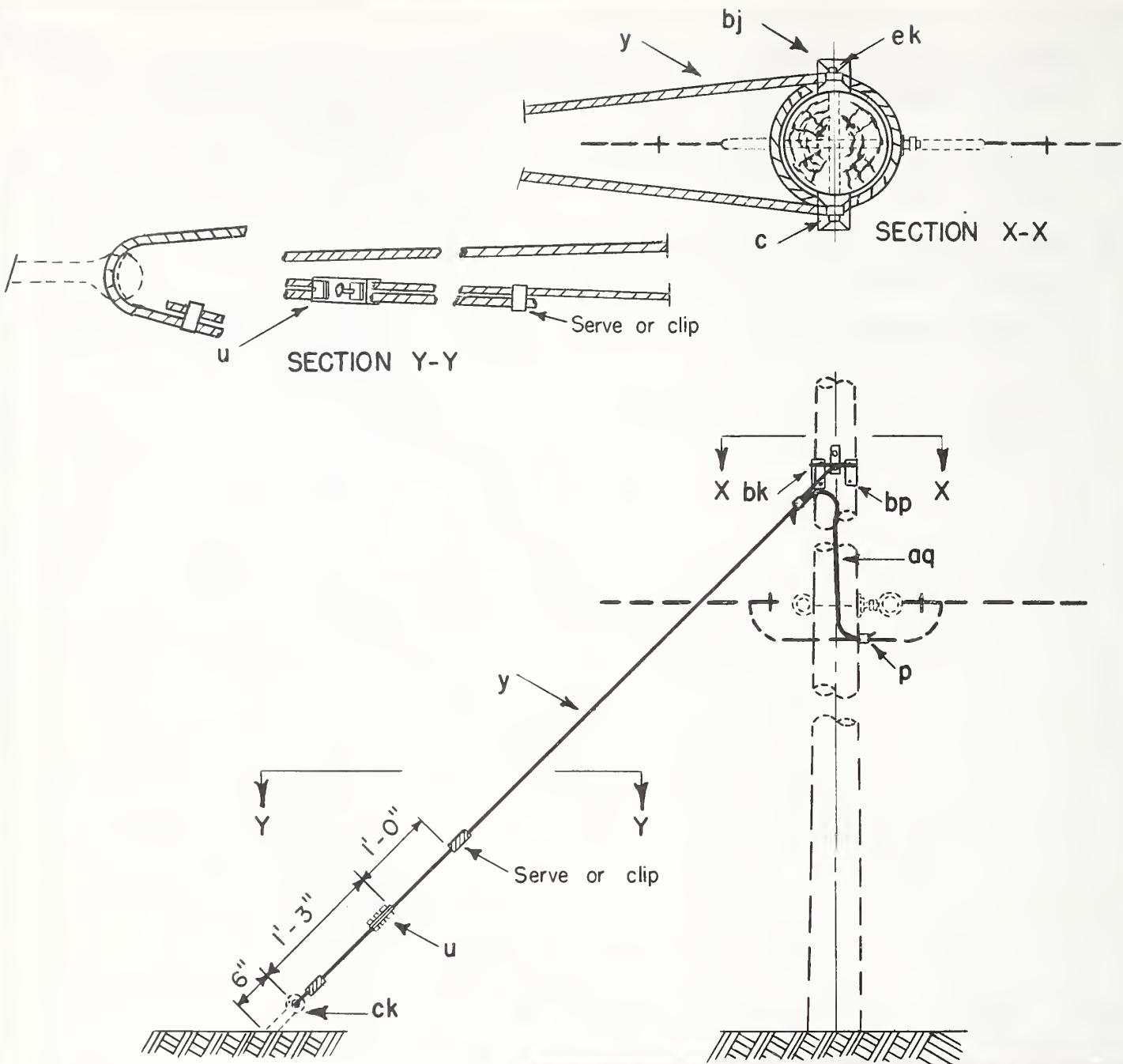
1. Spacing between anchors shall be sufficient to provide maximum holding power of each anchor.
2. For loose soils, concrete or other pole footings are recommended.
3. Other accepted and equivalent (item u) deadend material may be substituted for the guy grips shown.
4. Wrapped guys may be substituted for pole bands shown.



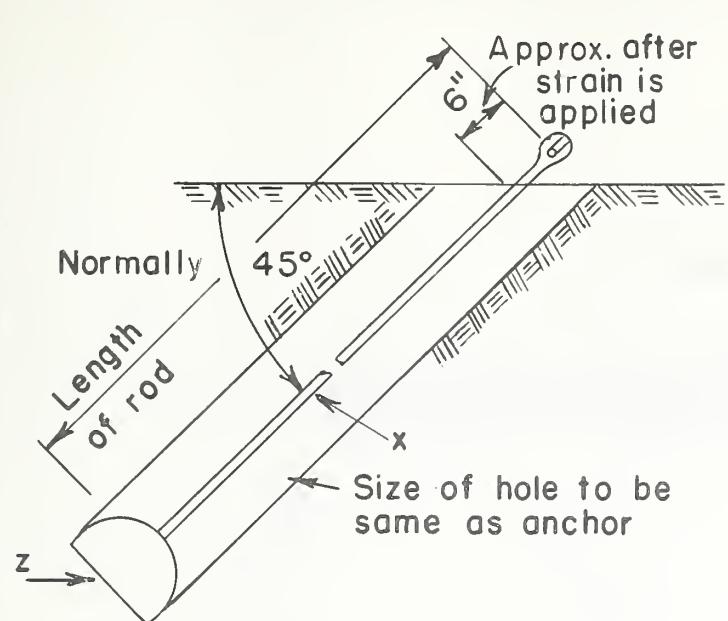
ASSEMBLY UNIT		
	VE8-2L-3/8" GUY WIRE	VE8-3L-7/16" GUY WIRE

ITEM	MATERIAL	No. Required	No. Required
p	Connectors, as required		
u	Deadend for guy strand	8	8
v	Guy attachment, pole band type	4	4
y	Guy Wire, S.M. 7 strand	required length	required length
aq	Jumpers, #6 S.D. or equiv. as required		
ck	Clamp, guy bonding	2	2

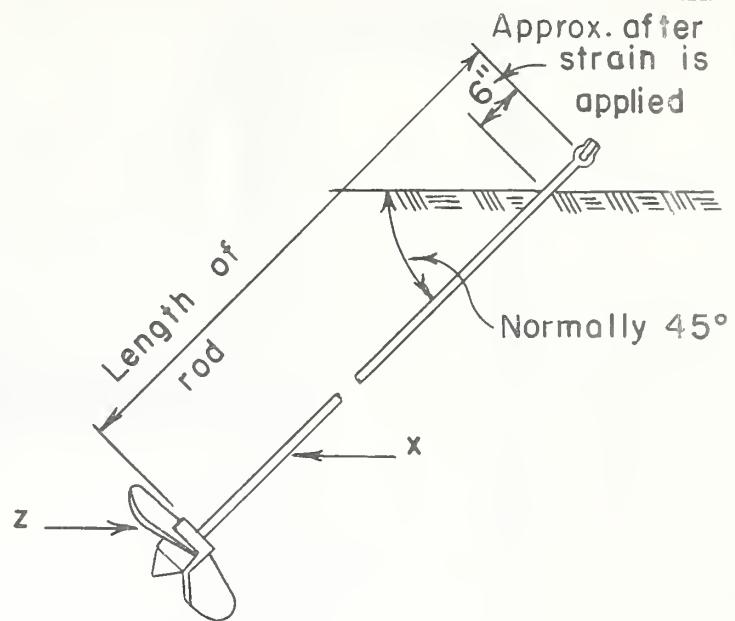
14.4 / 24.9 KV
FOUR DOWN GUYS
(LARGE CONDUCTORS)



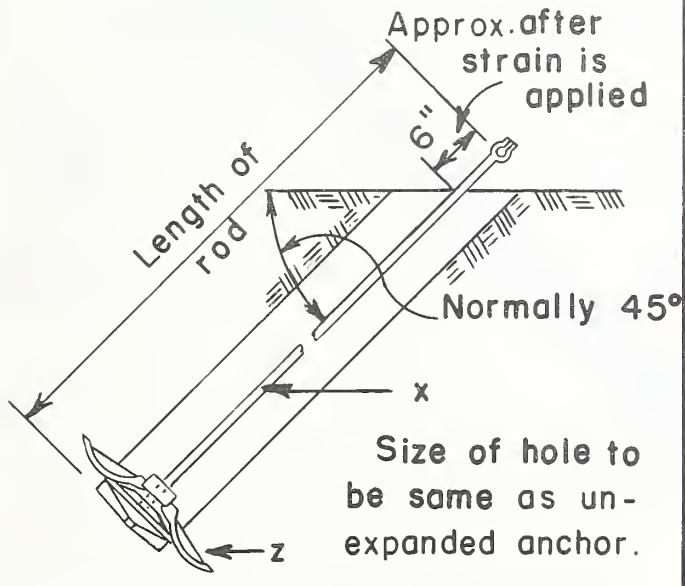
ASSEMBLY UNIT			
	E11 1/4" GUY WIRE	E12 3/8" GUY WIRE	
ITEM	MATERIAL	NO. REQ'D.	NO. REQ'D.
c	Bolt, machine, 5/8"x req'd. length	1	1
u	Clamp, guy	I-Medium Duty	I-Medium Duty
y	Guy wire, S-M	req'd. length	req'd. length
ck	Clamp, anchor rod bonding	1	1
bj	Guy hook, J	2	2
bk	Guy plate, 4"x 8", 14 gauge	2	2
bp	Nail, 8 penny, galv.	8	8
aq	Jumper, #6 S.D. copper or equivalent		
p	Connectors, as req'd.		
ek	Locknuts		
7.2/12.5 KV SINGLE LOOP GUY, WRAPPED TYPE			
Jan 1, 1962			E11, E12



CONE
FI-1C, FI-2C, FI-3C,



SCREW
FI-1S, FI-2S, FI-3S, FI-4S



EXPANDING
FI-1, FI-2, FI-3, FI-4
Note: Projection of anchor rods above earth
may be increased to a max. of 12" in
cultivated fields or other locations
where necessary to prevent burying
of the rod eye.

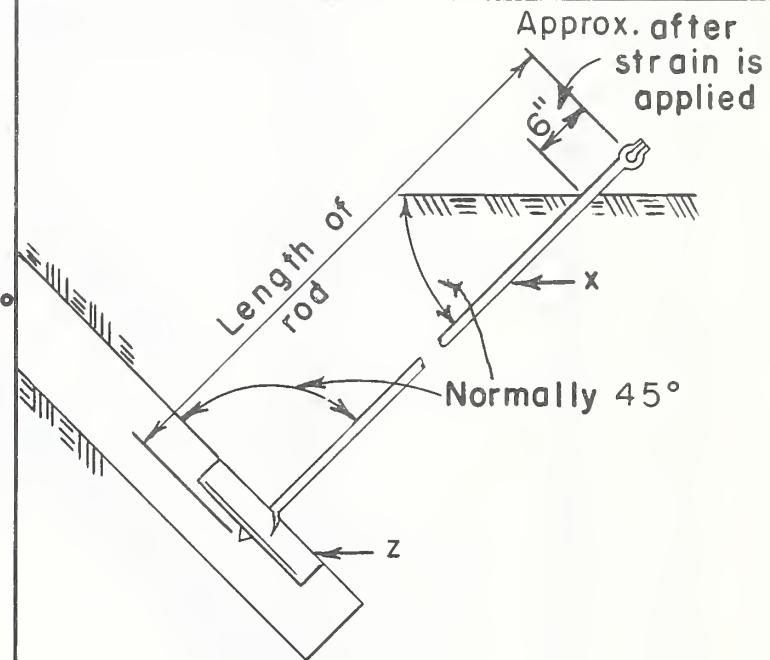
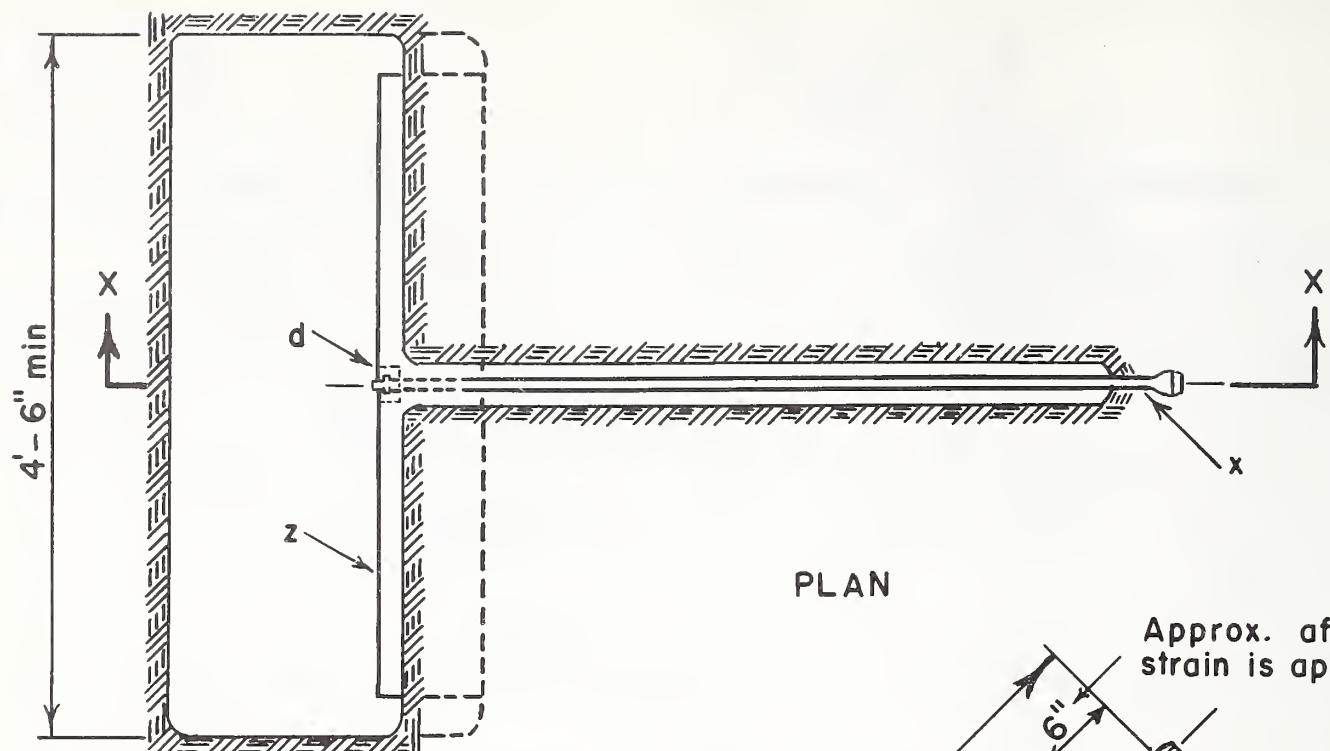


PLATE
FI-1P, FI-2P, FI-3P, FI-4P

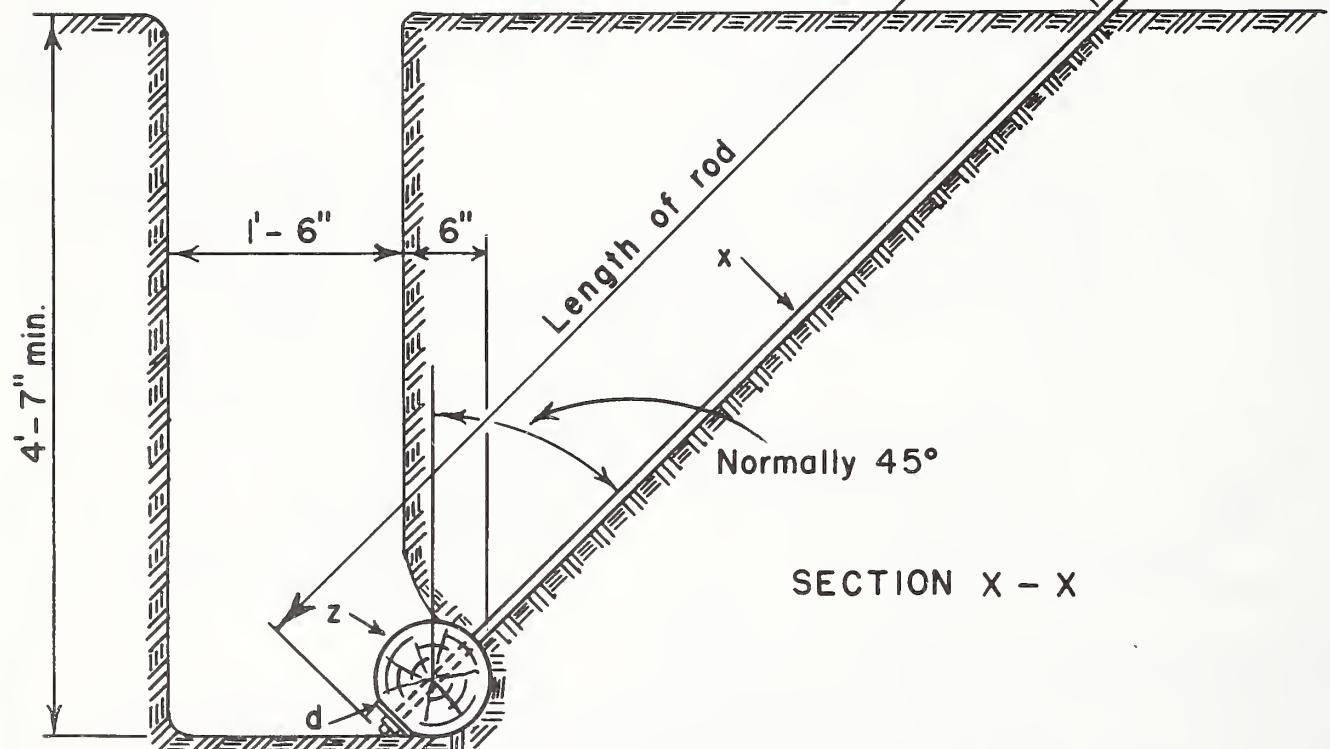
ASSEMBLY UNIT					
	FI - 1	FI - 2	FI - 3	FI - 4	
ITEM	MATERIAL	NO.	NO.	NO.	
x	Rod, anchor, thimble eye	1	5/8" x 7'-0"	1	5/8" x 7'-0"
x	Rod, anchor, twin eye				1 3/4" x 8'-0"
z	Anchor----- type	1	1	1	1

LINE ANCHOR ASSEMBLIES



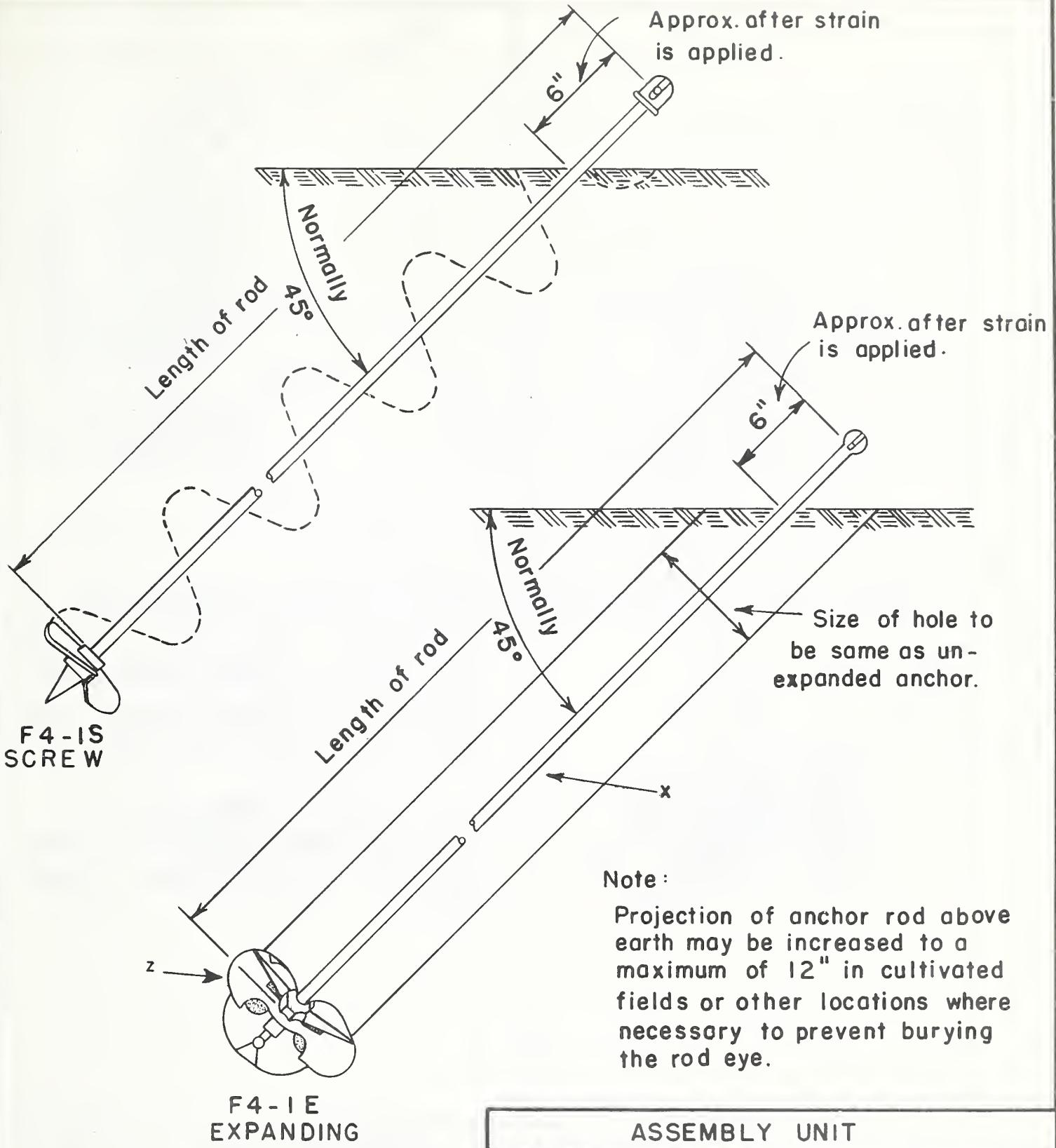
PLAN

Approx. after strain is applied

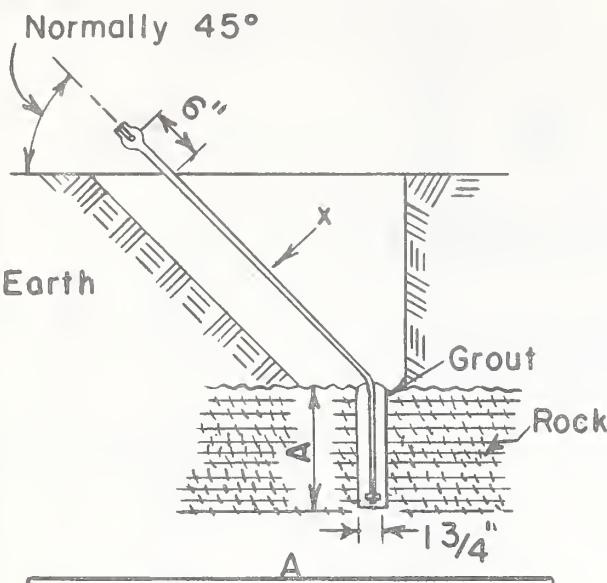


SECTION X - X

ITEM	MATERIAL	ASSEMBLY UNIT			
		NO.	TYPE	NO.	TYPE
d	Washer, 13/16" hole, (1 1/8" min. for F2-4)	1	4"x 4"x 1/2"	1	4"x 4"x 1/2"
x	Rod, anchor, thimble type eye	1	5/8"x 7'-0"	1	3/4"x 8'-0"
z	Anchor, (creosoted log)	1	8"dia.x4'-0"	1	9"dia.x4'-6"
	Holding power in ordinary soil, (pounds)		8000		10,000
					12,000
					16,000
LOG ANCHOR ASSEMBLY					
Jan. 1, 1962		F2-1 To F2-4			

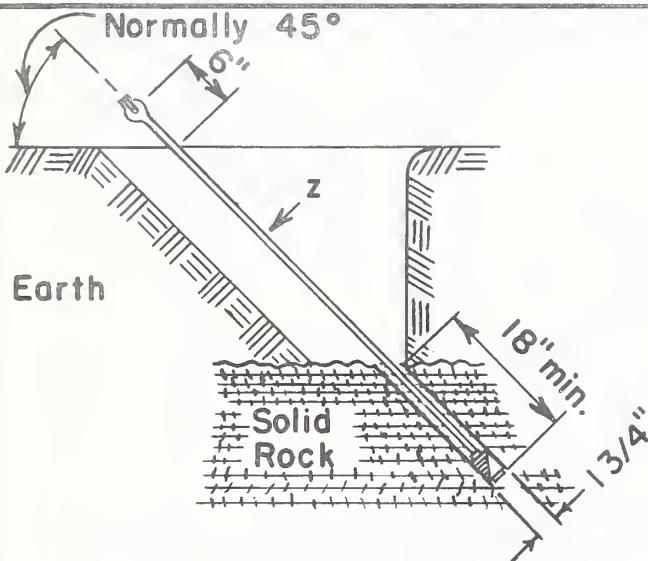


ASSEMBLY UNIT					
F4-IS		F4-IE			
ITEM	MATERIAL	NO.	NO.		
x	Rod, anchor, thimble type eye		1	5 ⁷ / ₈ " x 6'-0"	
z	Anchor, service	1	1		
	Holding power	2500 #	2500 #		
			SERVICE ANCHOR ASSEMBLY		
			Jan 1, 1962		F4-1

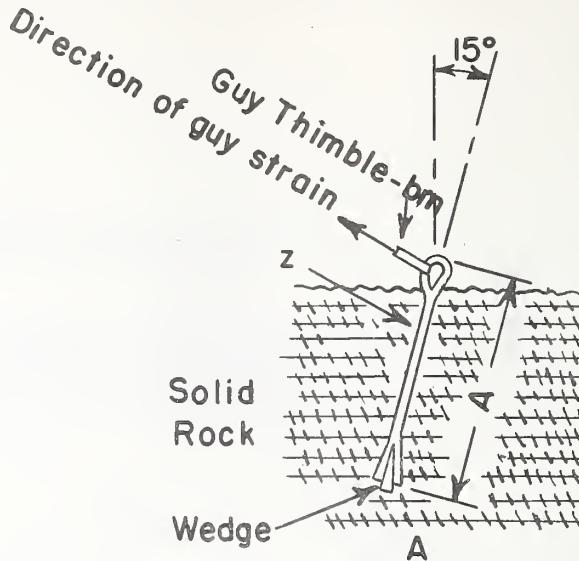


18" min. for sound solid rock
30" min. for stratified rock

F5 - 1



F5 - 3



Guy Bolt 18"
Rock Anchor 15"

F5 - 2

Notes:

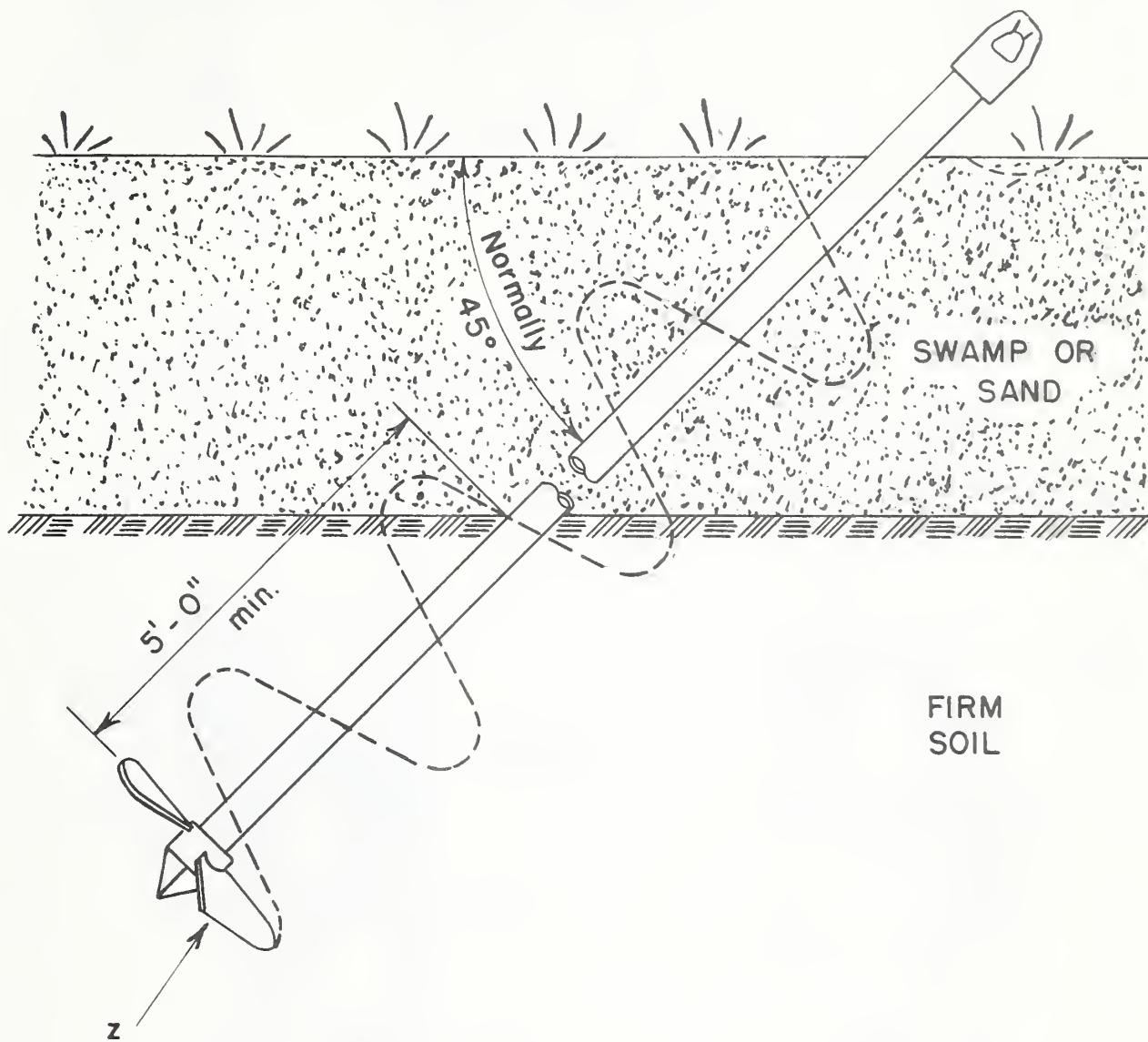
1. Only one guy shall be attached to a rock anchor. Where more than one guy is required space anchors 2 ft. minimum and where practical they shall be in direct line with pole.
2. Do not anchor to any boulder measuring less than 5 ft. in two directions at right angles to each other.

ASSEMBLY UNIT

	F5-1	F5-2	F5-3	
ITEM	MATERIAL	No. REQ'D	No. REQ'D	No. REQ'D

x	Rod, anchor or thimble type eye	1		
z	Anchor, rock		1	1
bm	Thimble, guy		1	

ROCK ANCHOR ASSEMBLIES



ITEM	MATERIAL	ASSEMBLY UNIT					
		F6-1		F6-2		F6-3	
		NO.	TYPE	NO.	TYPE	NO.	TYPE
Z	Anchor, swamp	1	10"	1	12"	1	15"
	Holding power		6000#		8000#		10,000#
	Nut, thimble type eye	1		1		1	
	Pipe, galvanized, as req'd						

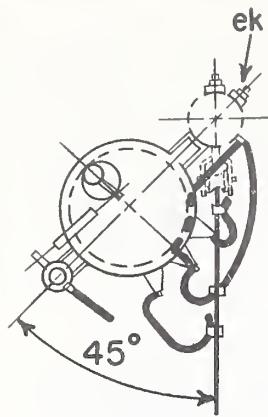
SWAMP ANCHOR ASSEMBLY

Jan 1, 1962

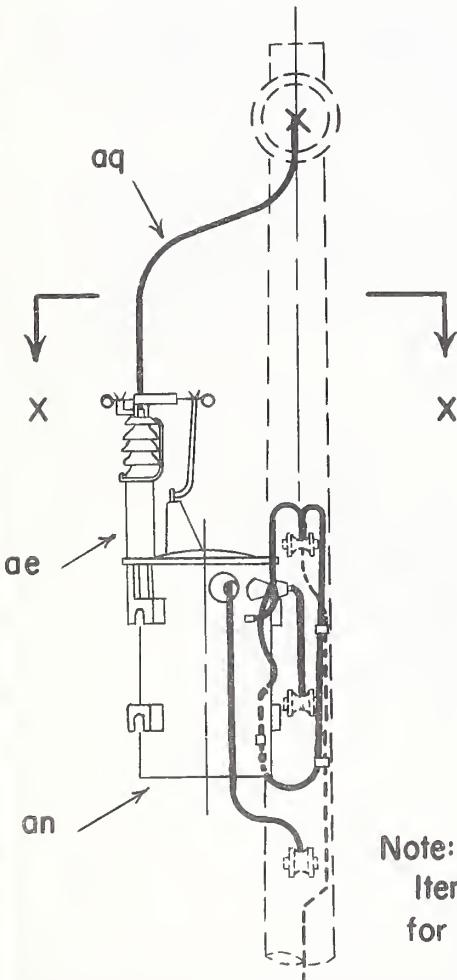
F6-1,F6-2,F6-3

Notes:

1. Designate VGIO for conventional transformer with tank mounted cutout and arrester, VG66 for transformer with double gaps and internal fuse, VG106 for self protected transformer.
2. See guide drawings for details of transformer secondary and service connections.

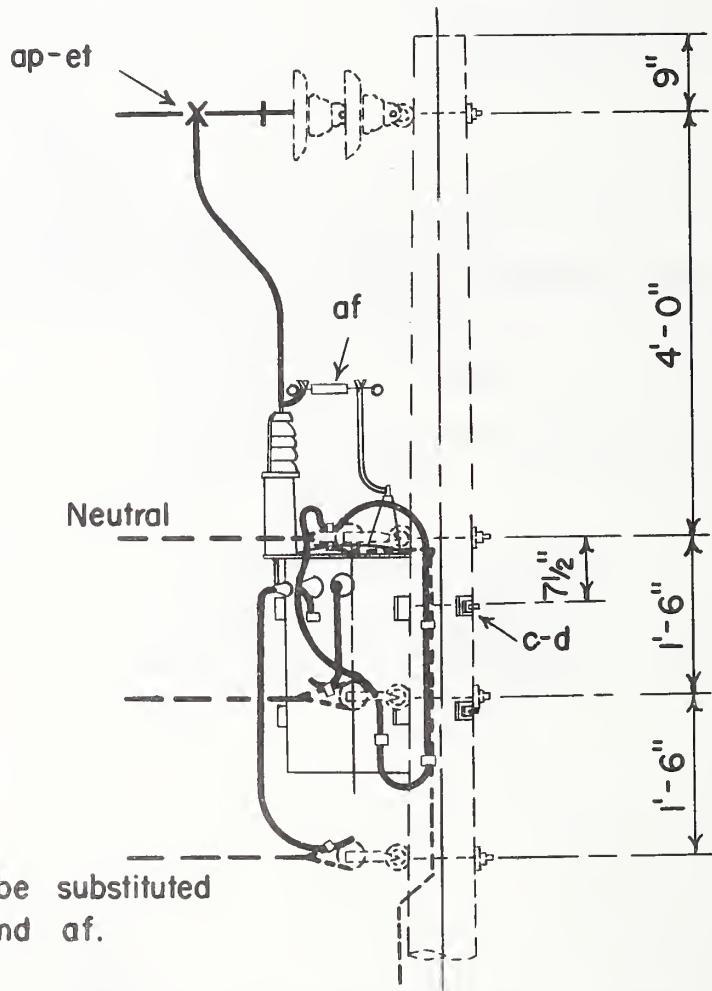


SECTION X-X



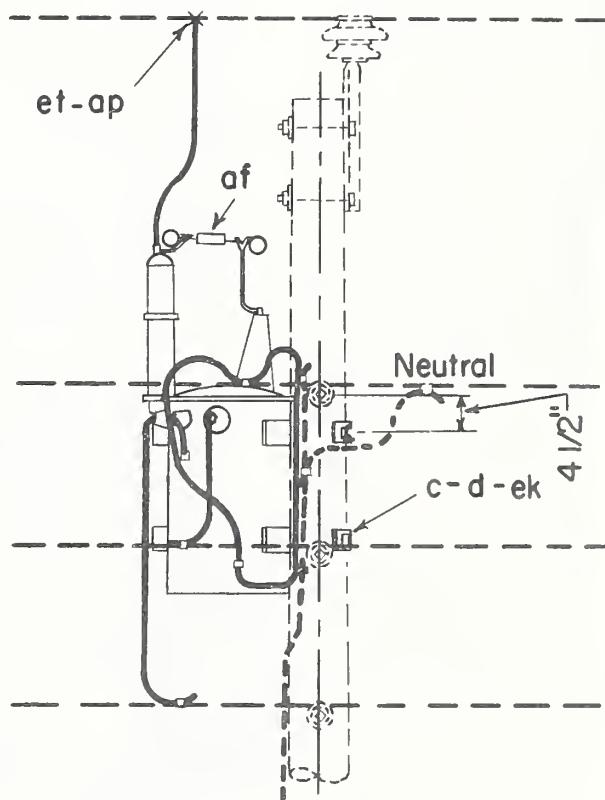
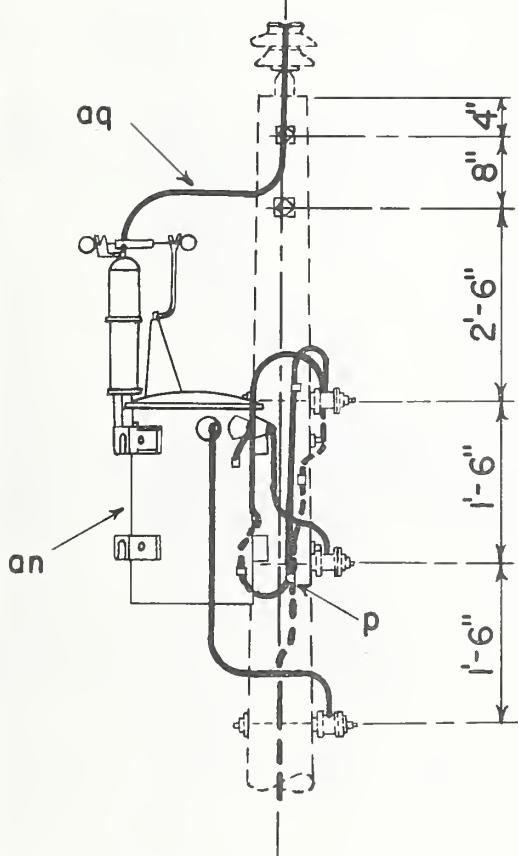
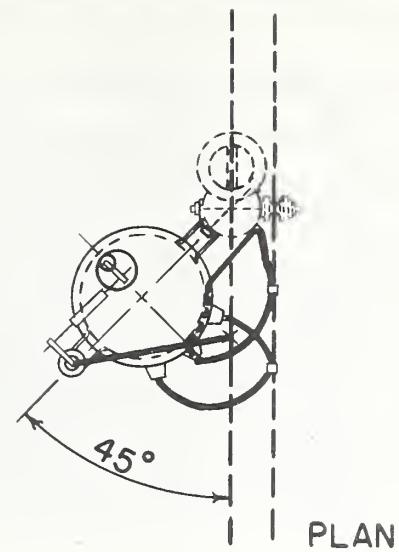
Note:

Item ax may be substituted
for items ae and af.



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c	2	Bolt, machine, 5/8" x req'd. length	an	1	Transformer
d	2	Washer, square, 2 1/4"	ap	1	Clamp, hot line, tap assembly
p		Connectors, as required	aq		Leads and jumpers, as required
ae	1	Lightning arrester (VG10 only)	et	1	Tap saddle
af	1	Cutout, fuse, open link (VG10 only)	ek		Locknuts

14.4/24.9 KV.
SINGLE PHASE TRANSFORMER
AT DEADEND



Notes:

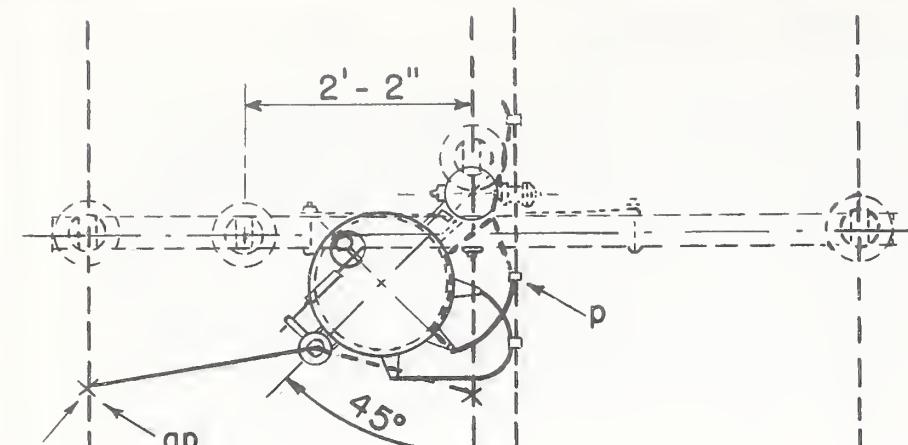
1. Designate VG19 for conventional transformer with tank mounted cutout and arrester, VG65 for transformer with double gap and internal fuse, VG105 for self protected transformer.
2. See guide drawings for details of transformer secondary and service connections.

ITEM	No.	MATERIAL	ITEM	No.	MATERIAL
c	2	Bolt, machine, 5/8" x req'd. length	an	1	Transformer
d	2	Washer, square, 2 1/4"	ap	1	Clamp, hot line, tap assembly
p		Connectors, as required	aq		Leads or Jumpers as required
ae	1	Lightning arrester (VG19 only)	et	1	Tap saddle
af	1	Cutout, fuse, single shot (VG19 only)	ek		Locknuts

14.4/24.9 KV.
SINGLE PHASE TRANSFORMER
AT 1-PHASE TANGENT

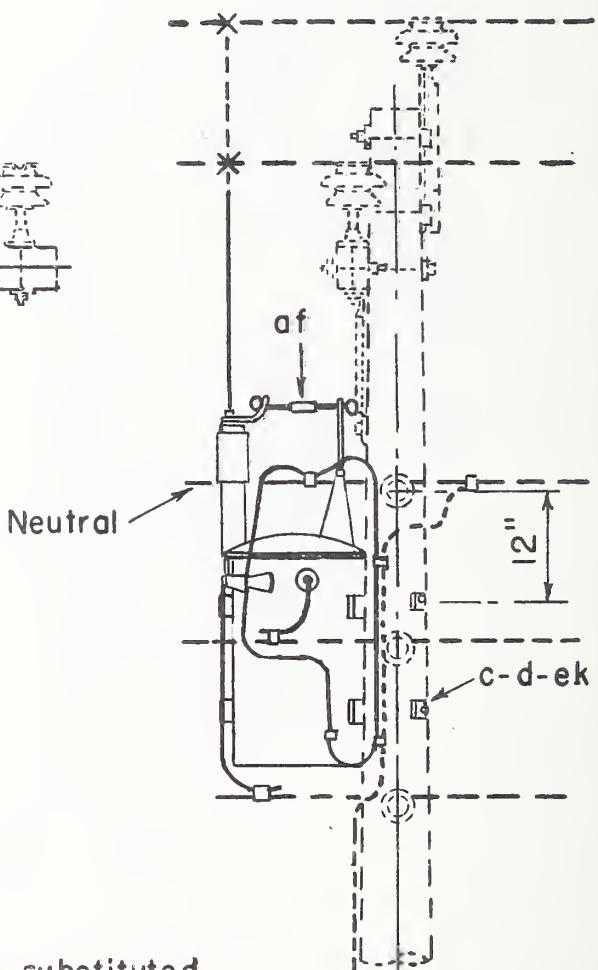
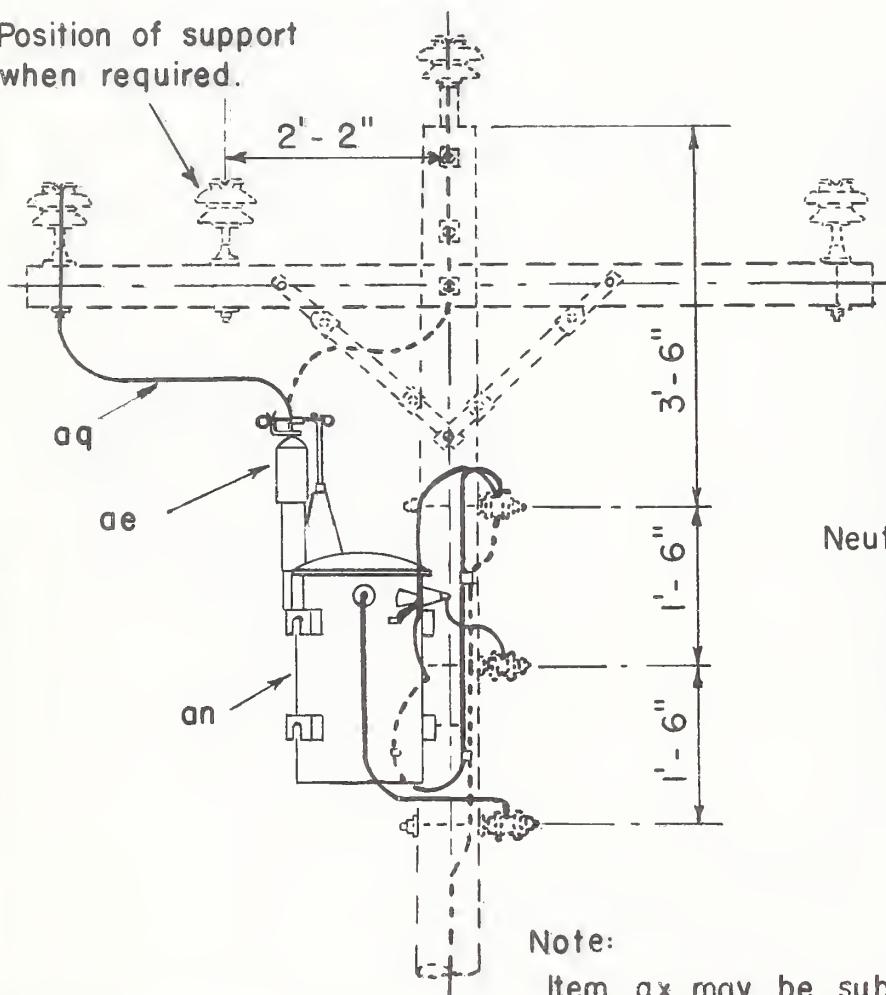
Notes: 1. Designate VG39 for conventional transformer with tank mounted cutout and arrester, VG67 for transformer with double gap and internal fuse and VG136 for self protected transformer.

2. See guide drawings for details of transformer secondary and service connections.
3. Reverse for connection to other outside phase.



PLAN

Position of support when required.



Note:

Item ax may be substituted for items ae and af.

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 2	Bolt, machine, 5/8" x req'd length	aq	Leads or jumpers as required
d 2	Washer, square 2 1/4"	af	Cutout, fuse, open link (VG 39 only)
p	Connectors, as required	ae	Lightning arrester (VG 39 only)
an 1	Transformer	et	Tap saddle
ap 1	Clamp, hot line, tap assembly	ek	Locknuts

14.4/24.9 KV.

SINGLE PHASE TRANSFORMER
ON THREE PHASE CIRCUIT

MATERIAL	
ITEM NO.	
c	2 Bolt, machine, 5/8" x required length
c	4 Bolt, machine, 3/4" x required length
d	13 Washer, square, 2 1/4"
g	1 Crossarm, 3 1/2" x 4 1/2" x 8' - 0"
i	2 Bolt, carriage, 3/8" x 4 1/2"
j	1 Screw, lag, 1/2" x 4"
k	2 Insulator, suspension, 6"
k	2 Insulator, suspension, 10"
n	1 Bolt, double ornate, 5/8" x reqd. length
o	1 Bolt, eye, 5/8" x required length
p	2 Connector, compression type
p	Connectors, os, required
oo	3 Nut, eye, 5/8"
oe	1 Arrester, lightning, 9 KV
ae	1 Arrester, lightning, 18 KV
af	1 Cutout, blade, 9 KV (G150 only)
af	1 Cutout, blade, 18 KV (VG150 only)
aq	1 Jumper, as required
on	1 Transformer, auto, 14.4 - 7.2
bu	2 Connector, solderless
ca	2 Deadend assembly, primary
cc	2 Deadend assembly, neutral
cu	2 Brace, wood, 28"
ea	1 Insulator, post type, with 7" stud - 12 KV (G150 only)
ea	1 Insulator, post type, with 7" stud - 25 KV (VG150 only)
ek	Locknuts
ek	2 Structural timber, 4" x 10" x 6' - 0"

*

* Specify this item to be furnished by the transformer manufacturer.

Notes:

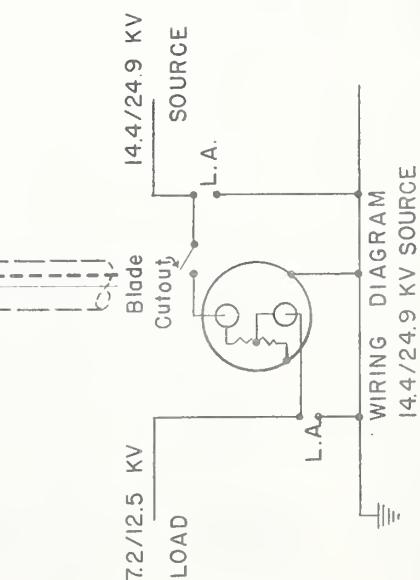
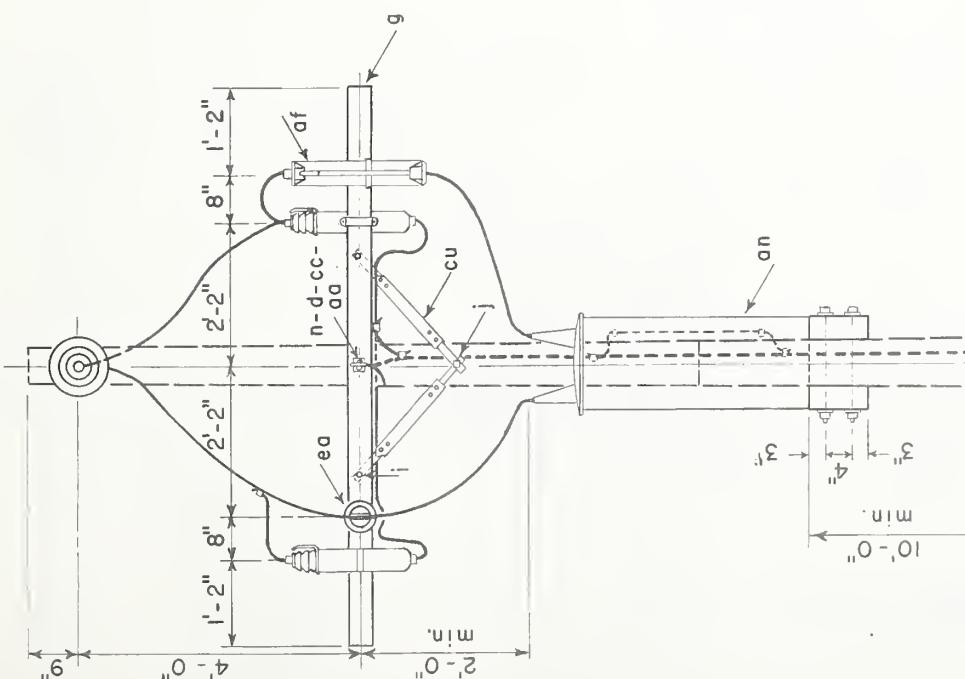
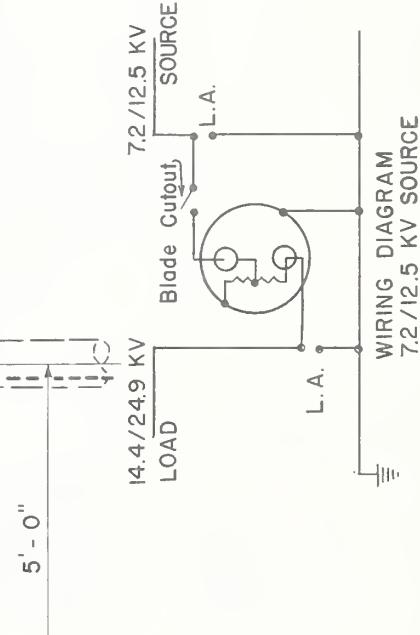
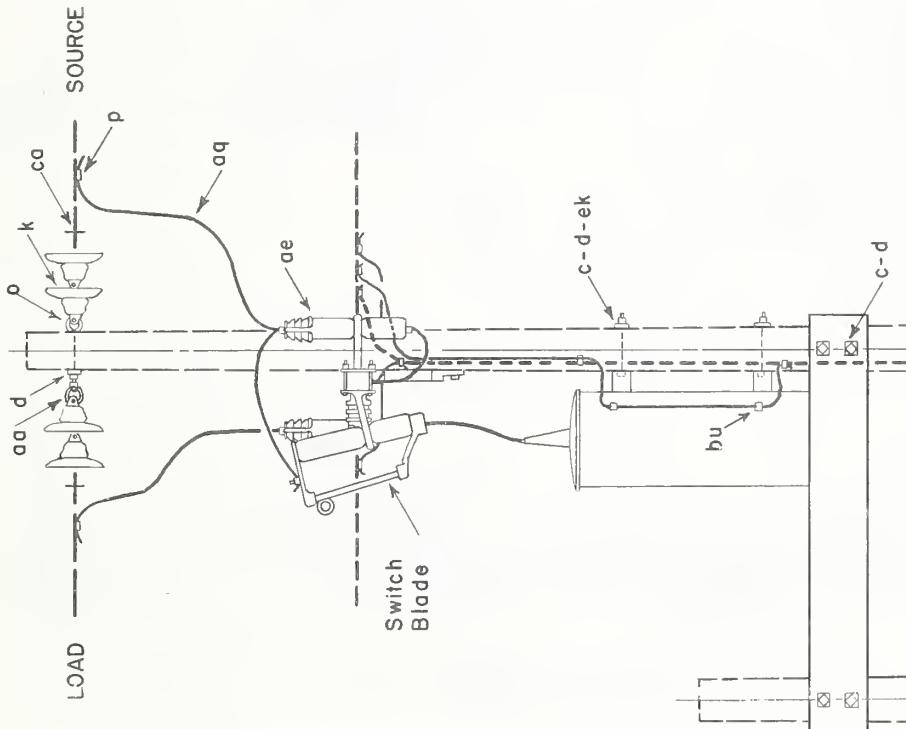
- All structural timbers to be treated per REA specifications.
- Designate as G150 when 7.2/12.5 KV is the source and VG150 when 14.4/24.9 KV is the source. Strike out items (as and ea) in material list which do not apply.

14.4/24.9 KV - 7.2 /12.5 KV
ONE AUTO TRANSFORMER

G150, VG150

Jan. 1, 1963

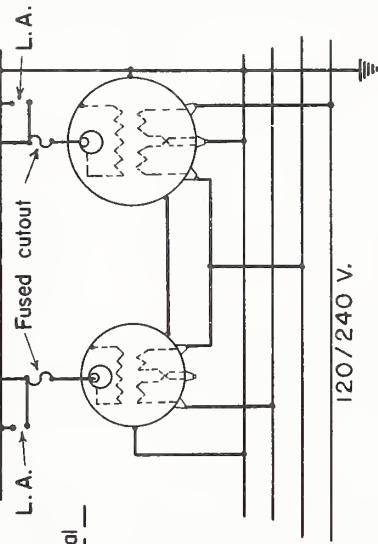
Jan. 1, 1963



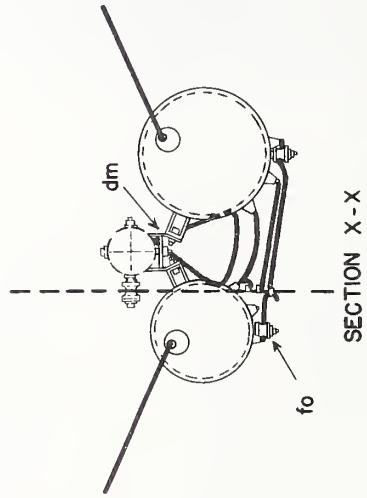
MATERIAL

ITEM NO.	MATERIAL
c	Bolt, machine, 5/8" x req'd. length
d	Washer, square, 2 1/4"
g	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	Bolt, carriage, 3/8" x 4 1/2"
j	Screw, lag, 1/2" x 4"
p	Connector, compression type
	Connectors, as required
an	Transformer, conventional 25 kva max.
aq	Jumper, secondary, weather - proof
	Jumper, bare, as required
ax	Cutout and arrester, combination
cu	Brace, wood, 28"
dm	Bracket, transformer
ea	Insulator, post type, with 7" stud
fo	Transformer secondary bracket
ek	Locknuts

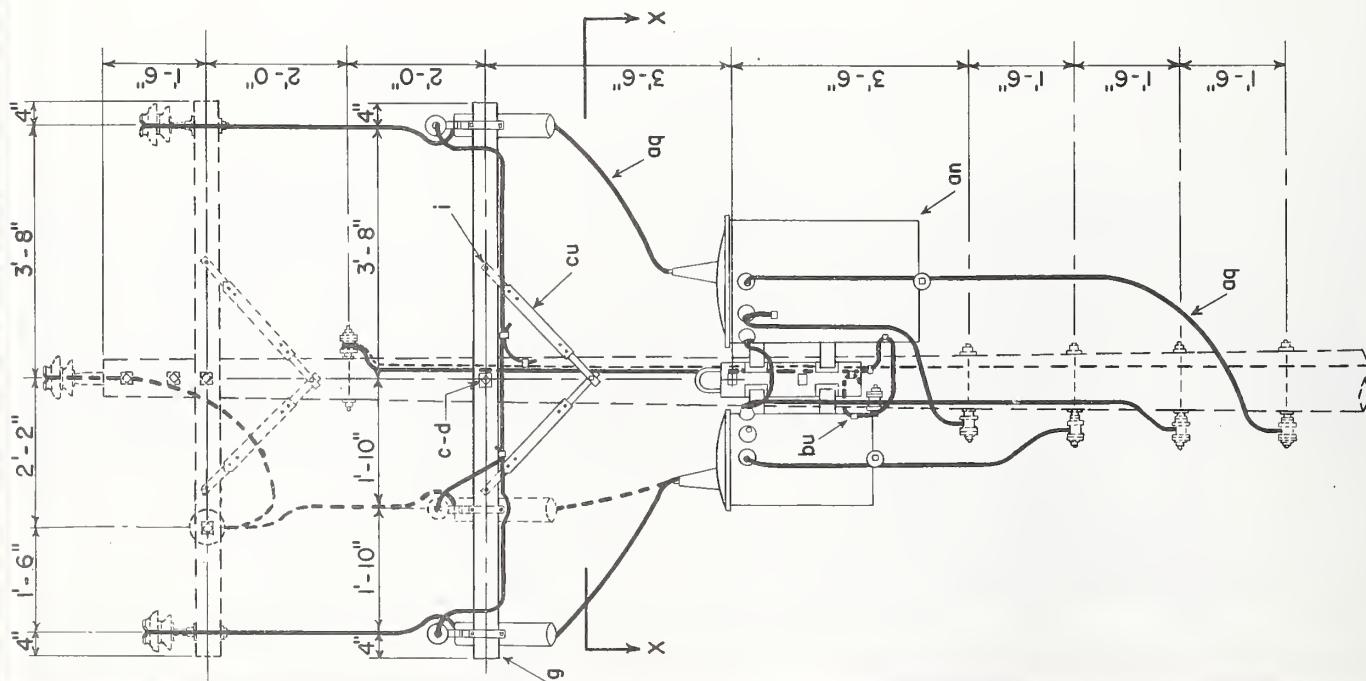
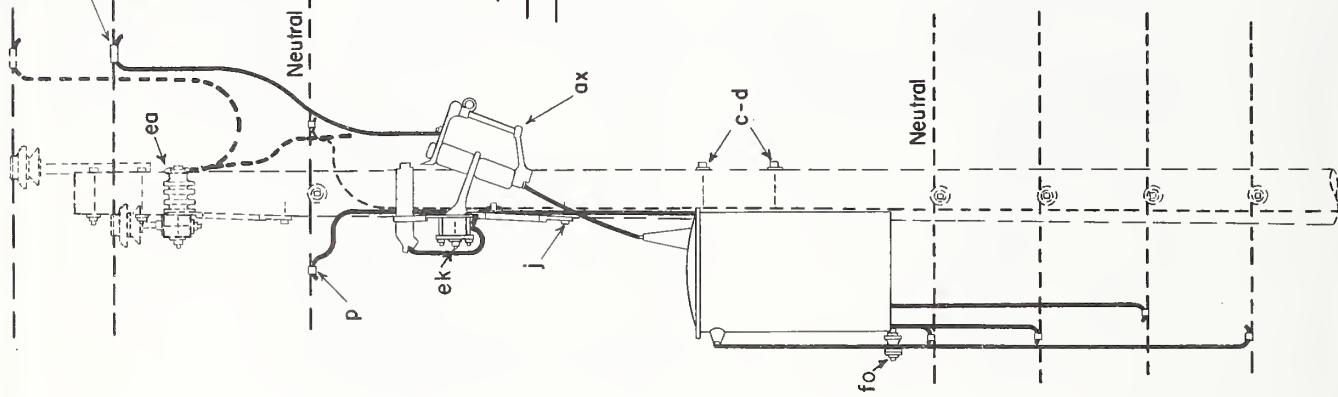
14.4 / 24.9 KV.



WIRING DIAGRAM



SECTION X-X



14.4/24.9 KV
TWO TRANSFORMERS, CLUSTER MOUNTED
OPEN WYE — OPEN DELTA
SINGLE PHASE AND THREE PHASE POWER LOAD

Jan. 1, 1963

VG210-

MATERIAL

ITEM NO	MATERIAL
d	10 Washer, square, 2 1/4"
g	2 Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	4 Bolt, carriage, 3/8" x 4 1/2"
j	Screw, lag, 1/2" x 4" as required
n	3 Bolt, double arming, 5/8" x reqd. length
p	3 Connectors, compression type
p	Connectors as required
aa	1 Nut, eye, 5/8"
an	3 Transformer, 100 kva maximum
aq	Jumper, bare, as required
aq	Jumper, secondary, weather-proof
ax	3 Cutout and arrester, combination
cu	4 Brace, wood, 28"
dm	Bracket, transformer, cluster-type with adapter plates as required
bu	4 Connector, solderless
ek	1 Link, neutral, grounding Locknuts
fo	3 Transformer secondary bracket

* Specify these items to be furnished by the transformer manufacturer.

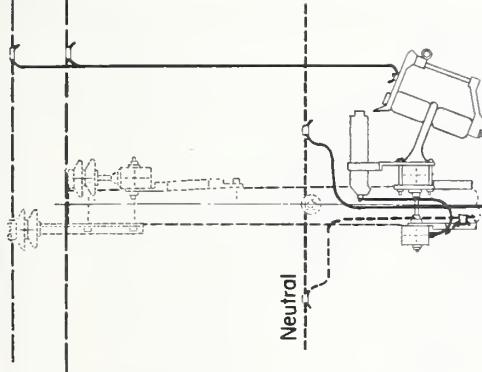
Notes

1. For transformers 25 KVA and smaller use one cluster bracket with adapter plates except one shall be disconnected from tanks and not grounded.
2. All tanks to be grounded.
3. Secondary neutrals of all transformers except one shall be disconnected from tanks and not grounded.
4. When used for combined single phase and three phase load the transformer for the single phase load shall not be larger than twice the capacity of one of the others.

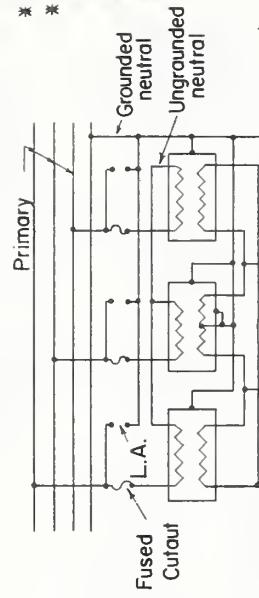
14.4/24.9 KV
THREE TRANSFORMERS CLUSTER MOUNTED
UNGROUNDED WYE DELTA FOR
120/240 VOLT POWER LOADS

Jan. 1, 1963

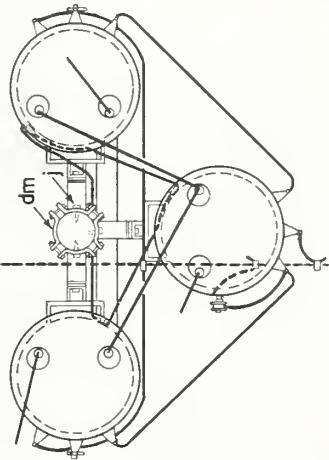
VG310-



TANGENT LINE ASSEMBLY

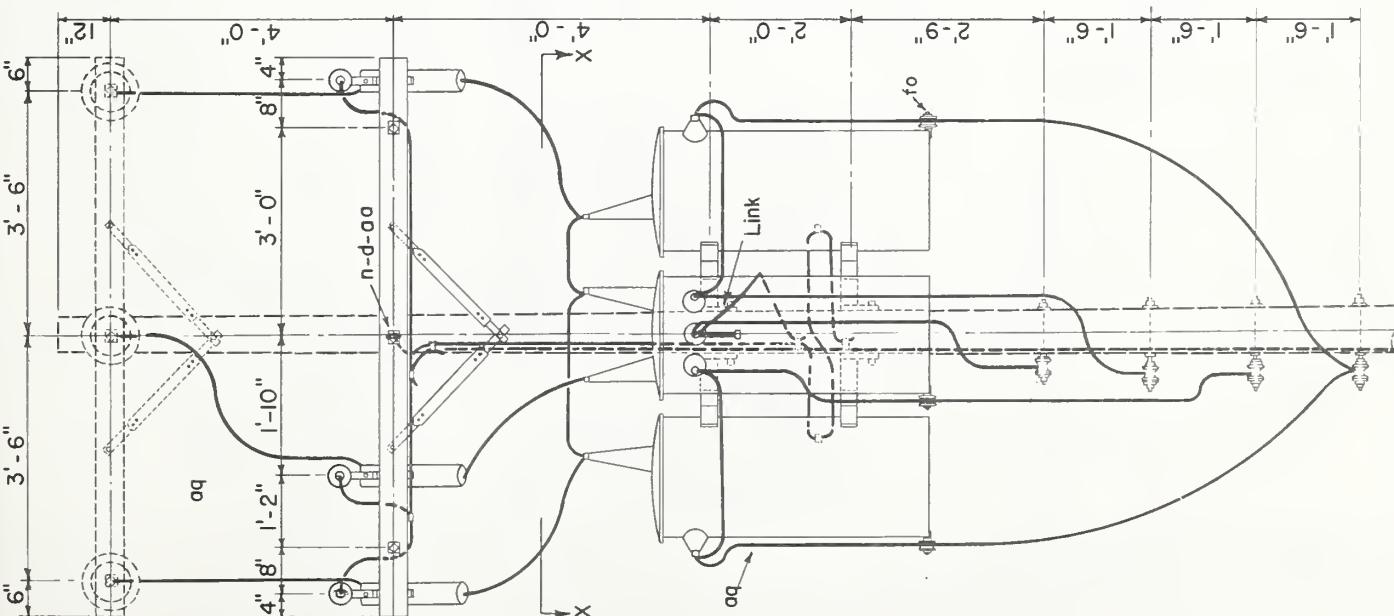
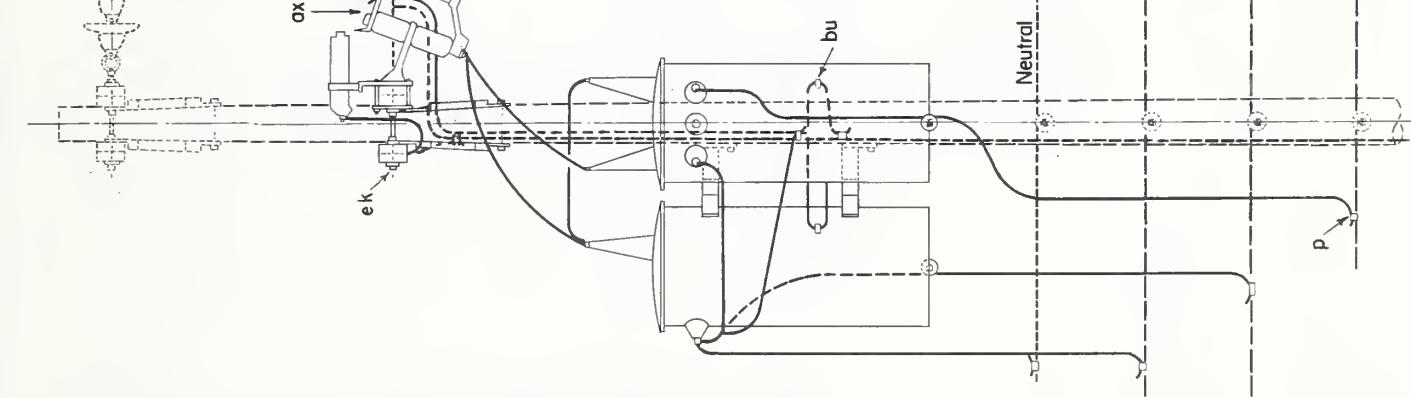


WIRING DIAGRAM



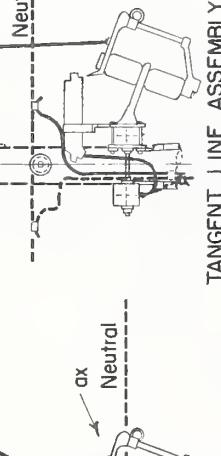
SECTION X-X

Note:
For metering see drawing M8-6

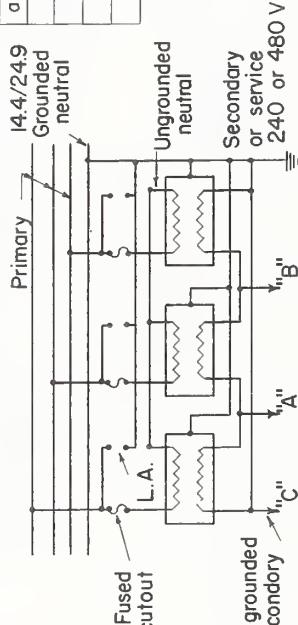


ITEM NO.

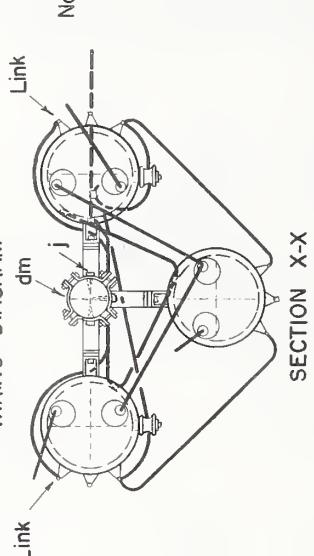
ITEM NO.	MATERIAL
d	2 Washer, square, 2 1/4"
g	2 Crossarm, 3 1/2" x 4 1/2" x 8-0"
i	4 Bolt, carriage, 3/8" x 4 1/2" x 4 1/2"
j	Screw, lag, 1/2" x 4", as required
n	3 Bolt, double arming, 5/8" x req'd. length
p	3 Connectors, compression type
on	3 Transformer, 100 kva max.
aq	Jumper, bare, as required
aq	Jumper, secondary, weather-proof
ax	3 Cutout and arrester combination
bu	5 Connector, solderless
cu	4 Brace, wood, 28"
dm	Bracket, transformer, cluster and adapter plates, as req'd.
ek	Locknuts
fo	2 Transformer secondary bracket
*	2 Link, grounding
aa	1 Nut, eye, 5/8"



TANGENT LINE ASSEMBLY



WIRING DIAGRAM



SECTION X-X

Note:
For metering assembly, refer to
drawing M8-3.

14.4/24.9 KV THREE TRANSFORMERS,
CLUSTER MOUNTED 3 WIRE GROUNDED
DELTA FOR 240 OR 480V POWER LOADS

Jan. 1, 1963

VG311 -

ITEM NO	MATERIAL
d	Washer, square, 2 1/4"
g	Grossarm, 3 1/2" x 4 1/2" x
i	Bolt, carriage, 3/8" x 4 1/2"
j	Screw, lag, 1/2" x 4" as re
n	Bolt, double arming, 5/8" x
p	Connector, compression type
p	Connectors, as required
an	Transformer, 100 KVA model
aq	Jumper, secondary, weather
aq	Jumper, bare, as required
ax	Cutout and arrester, cam
3	Link, grounding *
bu	Connector, solderless *
cu	Brace, wood, 28"
dm	Bracket, transformer, clustered
	plates as required
ek	Lacknuts
fo	Transformer secondary bridge insulated

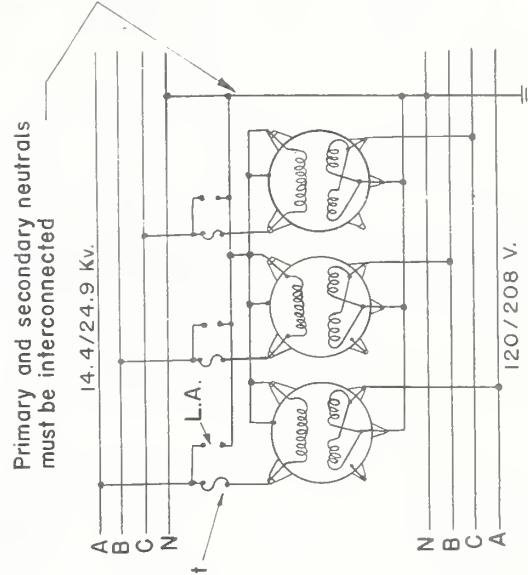
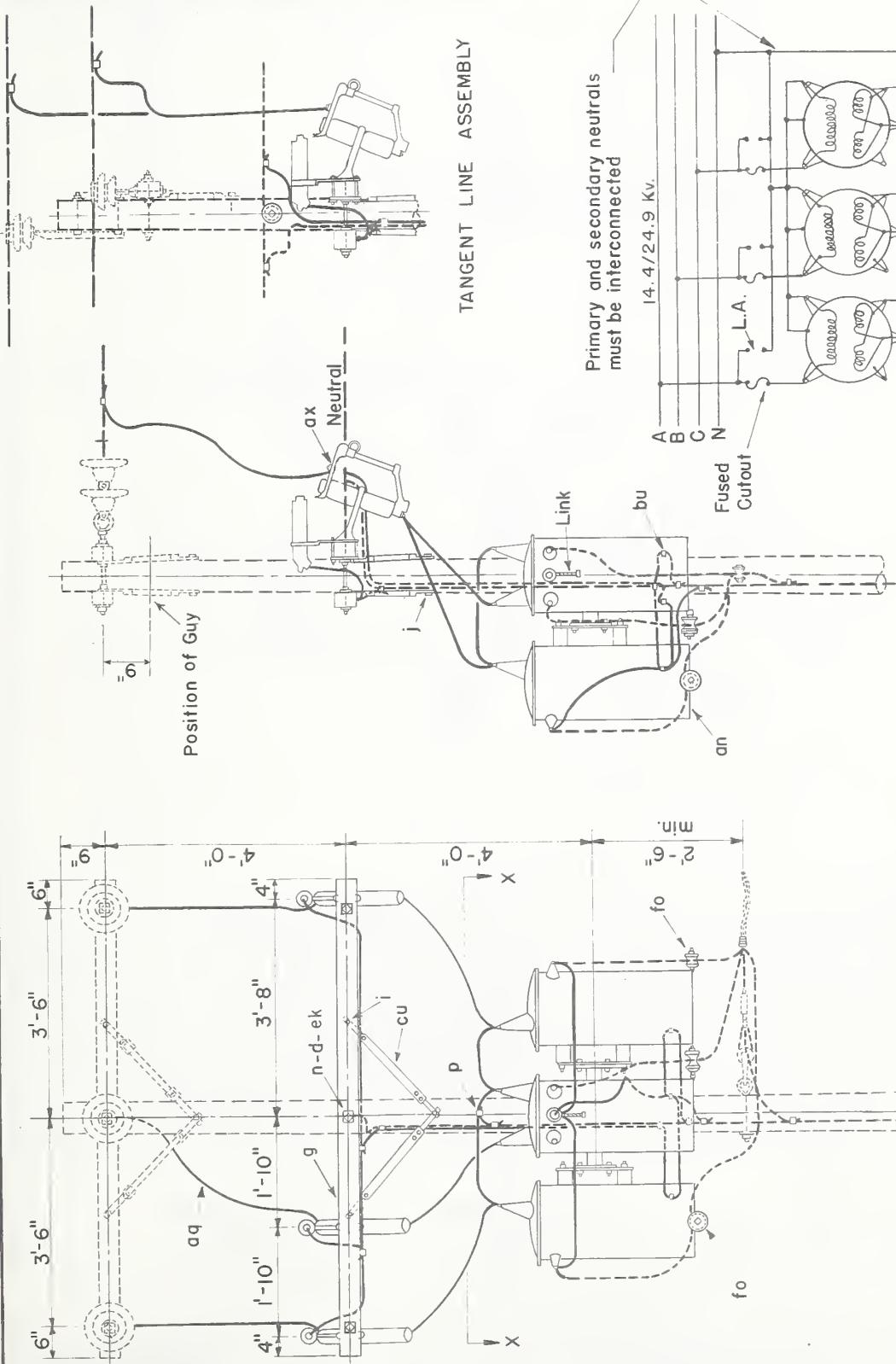
*Specify these items to be furnished by the manufacturer.

Notes:

1. For transformers 37 1/2 KVA & larger use two cluster brackets and dimension as shown on V5 310.
2. Single bushing transformers may be used if desired.
3. Re-connect internal windings of secondary as shown.
4. For metering see drawing M8-||.

14.4/24.9 KV.
THREE TRANSFORMERS, CLUSTER MOUNTED
4-WIRE GROUNDED WYE - GROUNDED WYE
FOR 120/208 VOLT POWER LOADS

1963

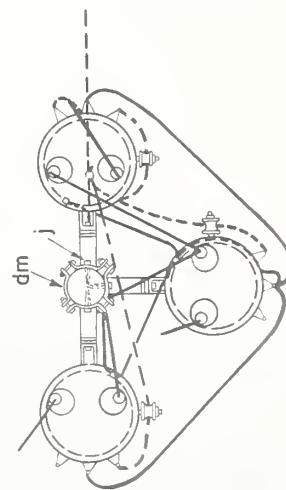


Primary and secondary neutrals must be interconnected

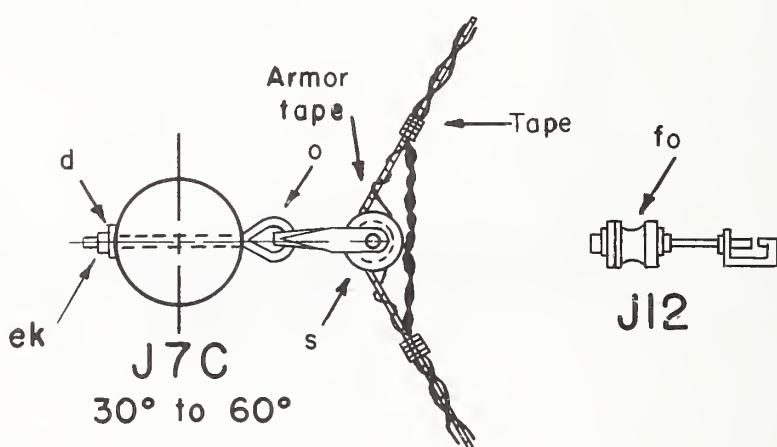
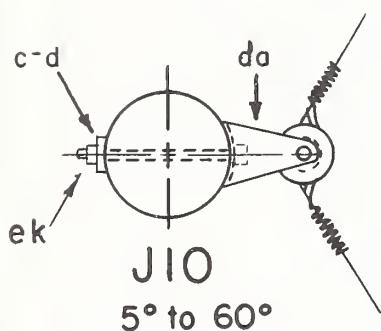
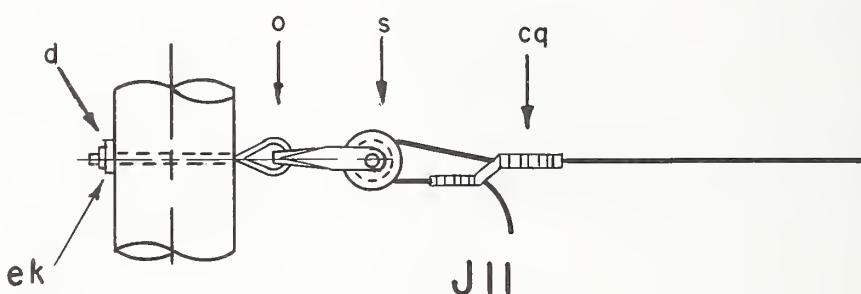
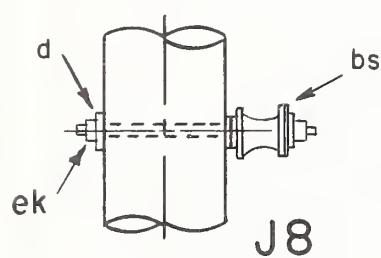
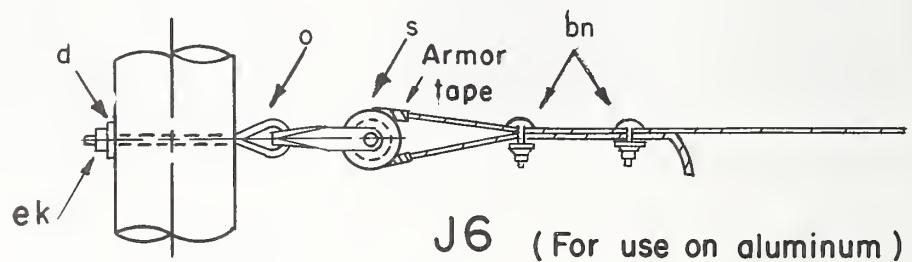
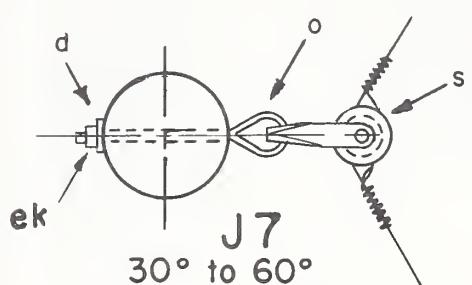
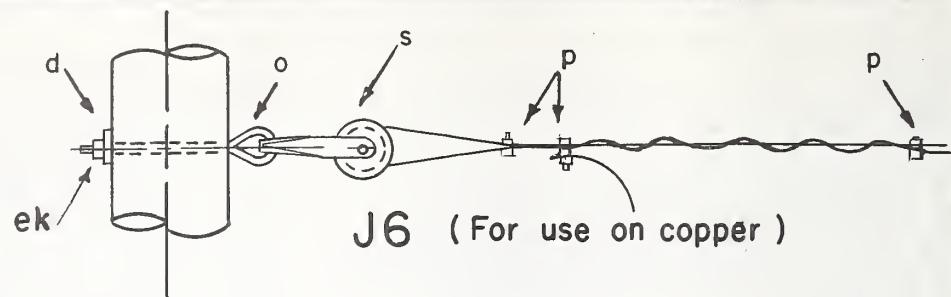
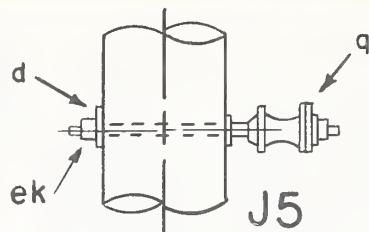
14.4 / 24.9 Kv.

A-
B-
C-
N-
Fused
Cultured

WIRING DIAGRAM



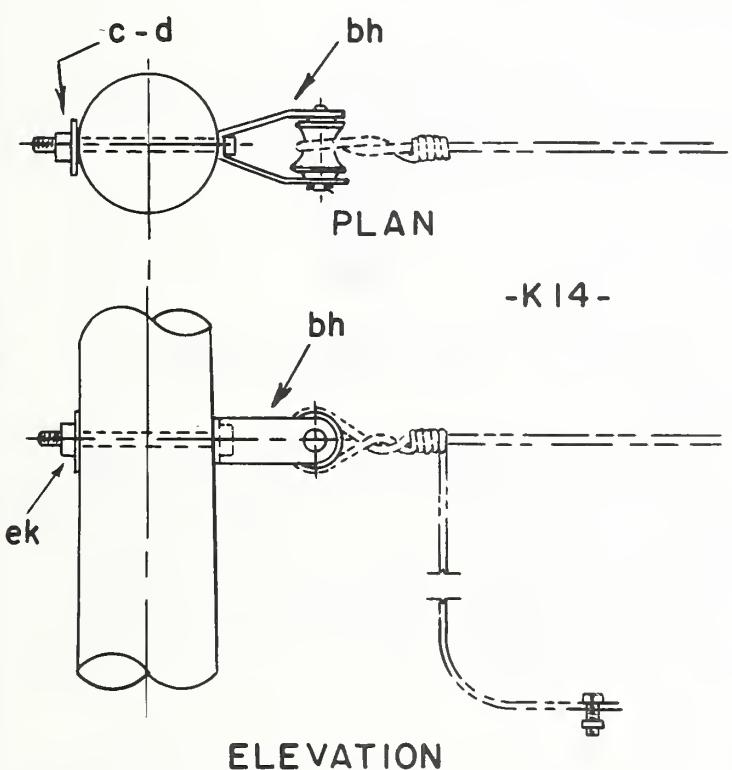
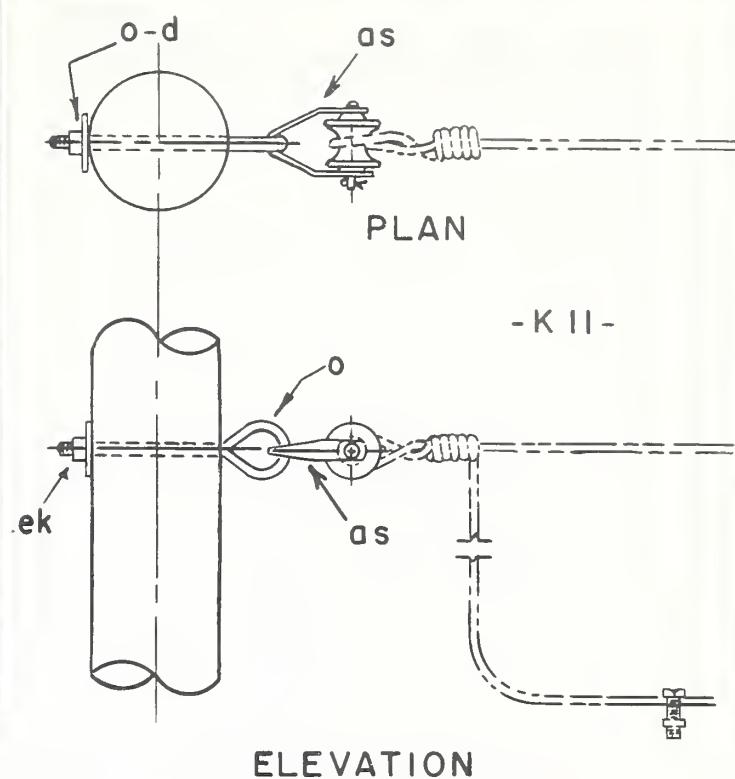
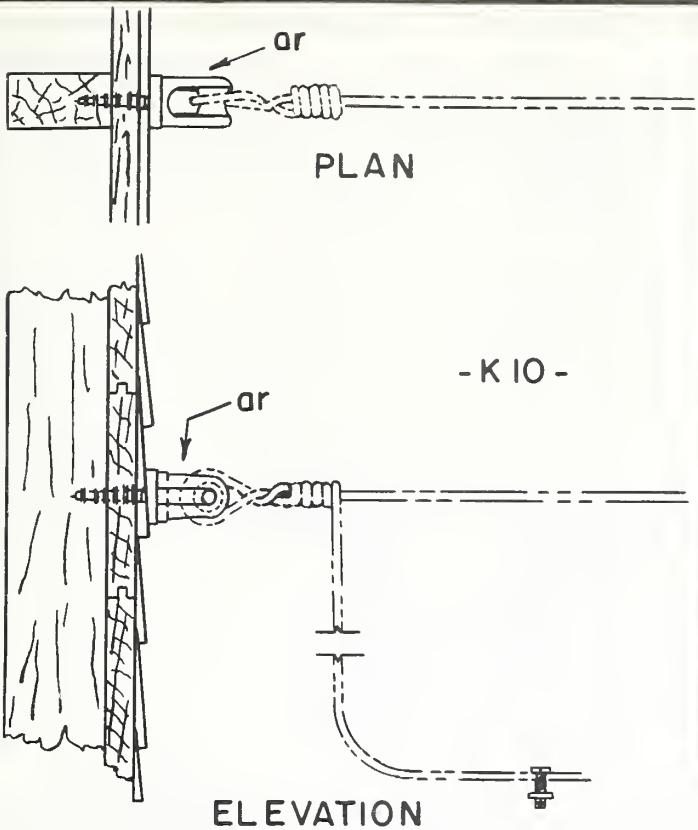
SECTION X-X



For use on Self Supporting
Service Cable

ITEM NO.	MATERIAL			MATERIAL
c	Bolt, machine, 5/8" x required length	bs		Bolt, single upset insulated
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole	bn		Clamp, loop, deadend
o	Bolt, eye, 5/8" x required length	cq		Sleeve, offset, splicing
p	Connectors, as required	da		Bracket, insulated
q	Bolt, double upset, insulated	fo		Transformer secondary bracket
s	Clevis, secondary, swinging, insulated	ek		Locknuts

SECONDARY ASSEMBLIES

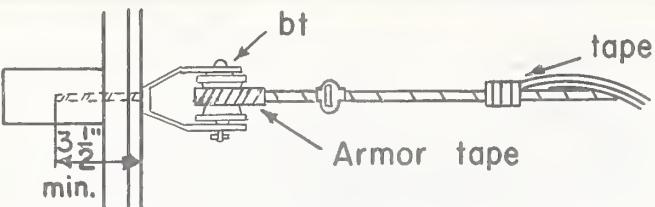


ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c	Bolt, machine, $5/8$ " x req'd length	as	Clevis, service, swinging, insulated
d	Washer, $2\frac{1}{4}$ " x $2\frac{1}{4}$ " x $\frac{3}{16}$ ", $\frac{13}{16}$ " hole	bh	Clevis, service, deadend, insulated
o	Bolt, eye, $5/8$ " x req'd length	ek	Locknuts
ar	Wire holder		

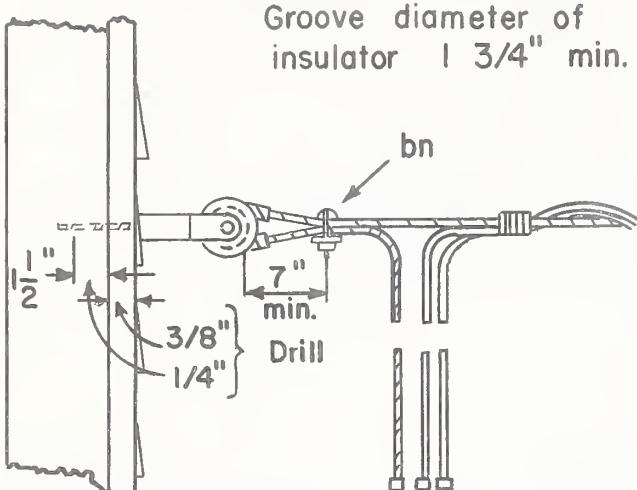
SERVICE ASSEMBLIES

Jan 1, 1962

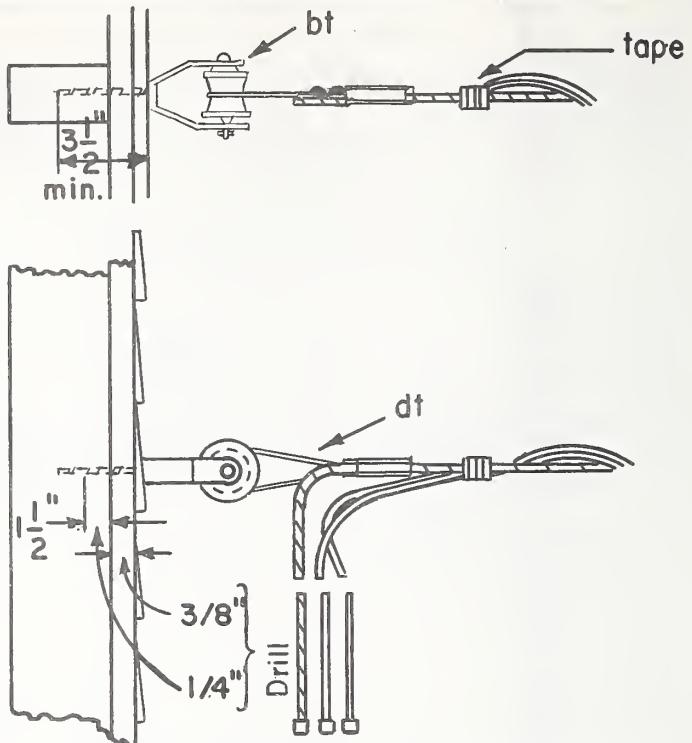
K10, K11, K14



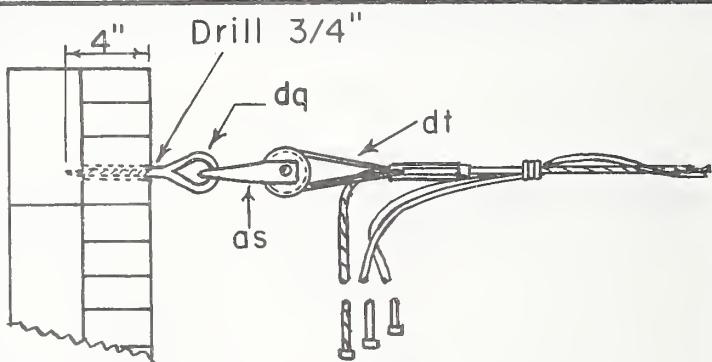
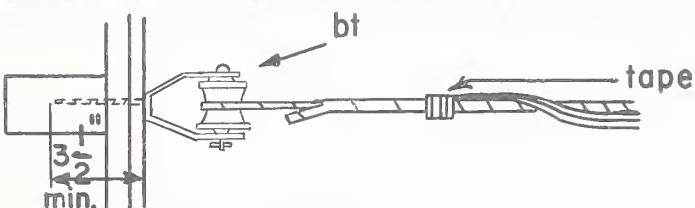
Note:
Groove diameter of
insulator 1 3/4" min.



LOOP TYPE



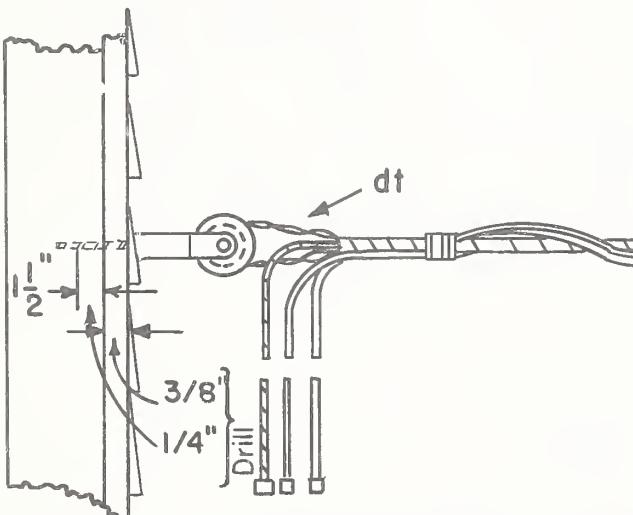
WEDGE TYPE



BRICK OR MASONRY

Notes:

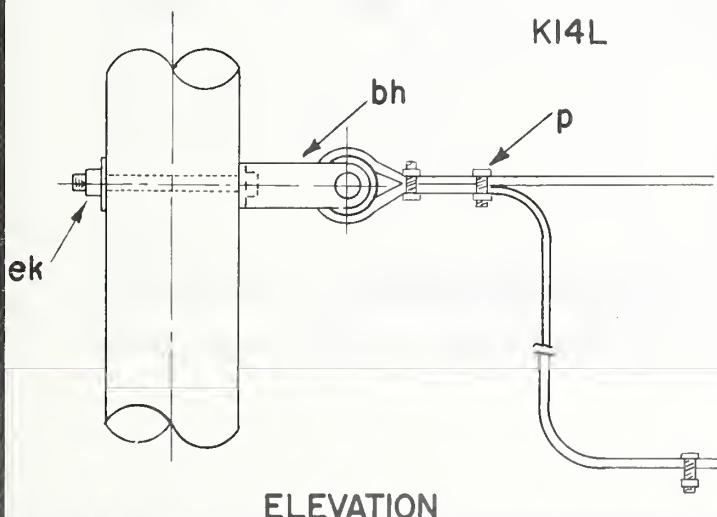
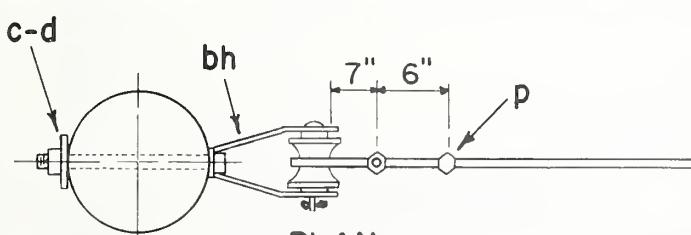
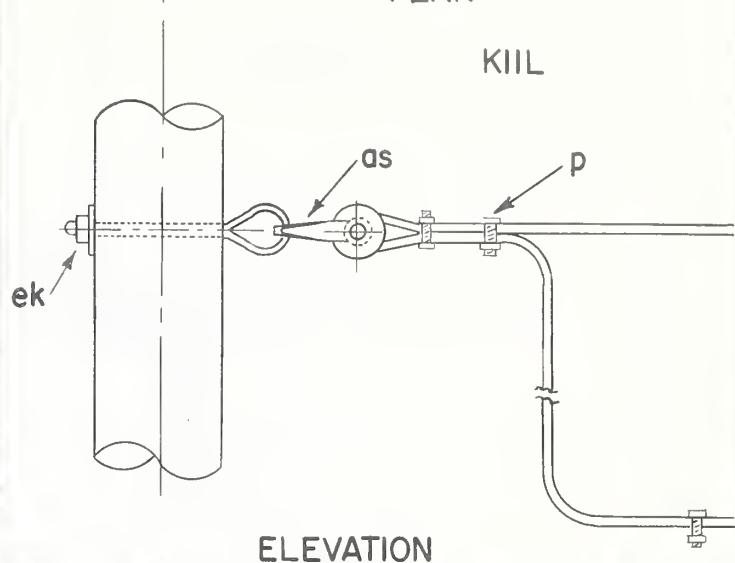
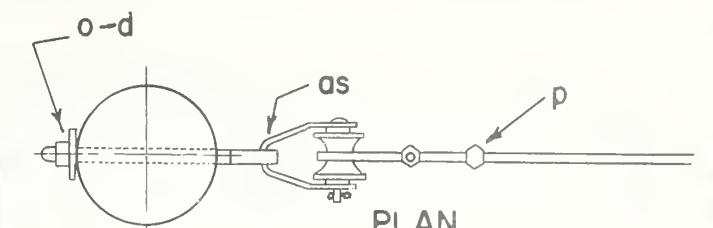
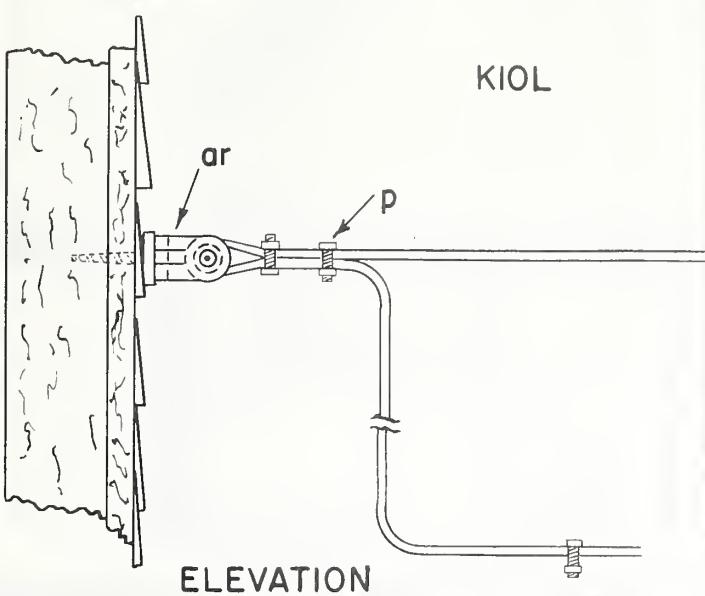
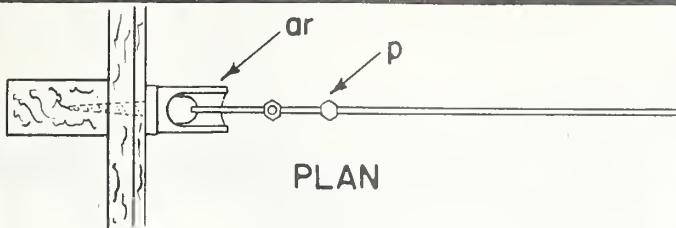
Wedge and preformed service deadends in sizes shown on page dt of the List of Materials may be subst. for those shown on KIIC, KI4C, KI5C, and KI6C. This type construction should be used for 3 or 4 conductor service cables with bare ACSR neutral.



PREFORMED TYPE

ITEM	MATERIAL	ITEM	MATERIAL
bt	Wireholder, clevis type, #24 woodscrew, insulated.	dt	Service deadend, wedge type.
p	Connectors, as required.	dt	Service deadend, preformed type.
bn	Clamp, loop deadend.	dq	Eye screw, elliptical, 1/2" x 6"
as	Clevis, service, insulated		3/4" x 3 1/2" expansion shield

SERVICE ASSEMBLIES, CABLE



NOTE 1:

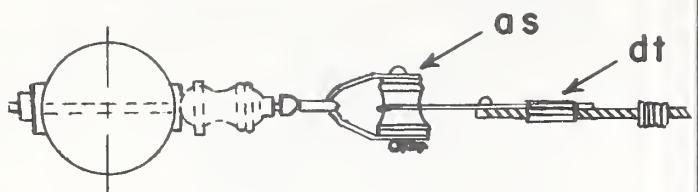
This type construction should be used for No. 2 aluminum weatherproof conductor and larger.

NOTE 2:

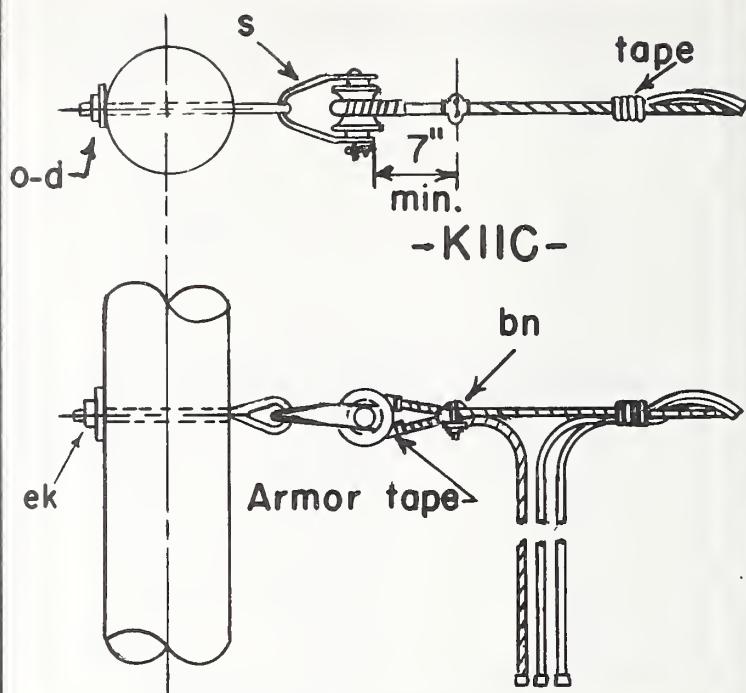
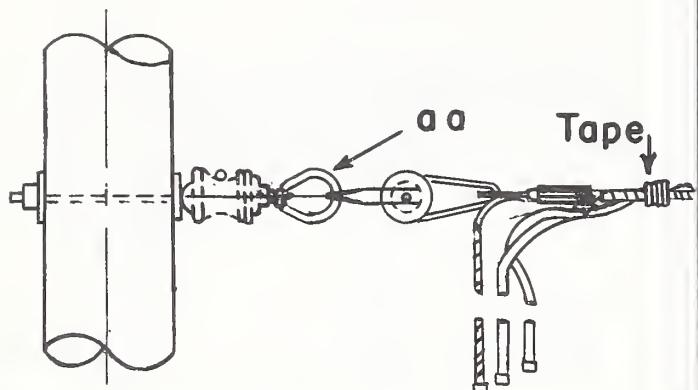
Connectors to be applied over bare wire and then taped as required.

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c	Bolt, machine, 5/8" x req'd. length	ar	Wireholder
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole	as	Clevis, service, swinging, insulated
o	Bolt, eye, 5/8" x req'd. length	bh	Clevis, service, deadend, insulated
p	Connectors, as req'd.	ek	Locknuts

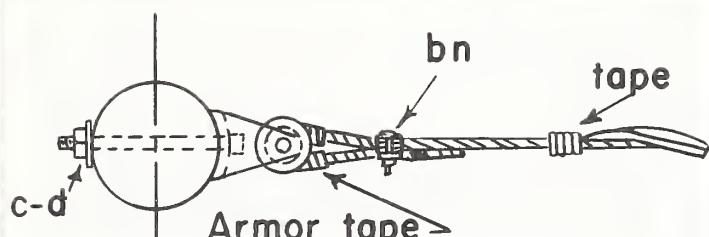
SERVICE ASSEMBLIES
(LARGE CONDUCTORS)



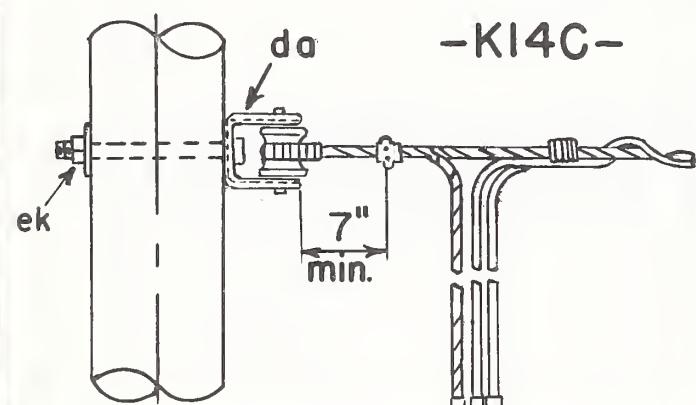
- KI5C -



- KIIC -



- KI4C -



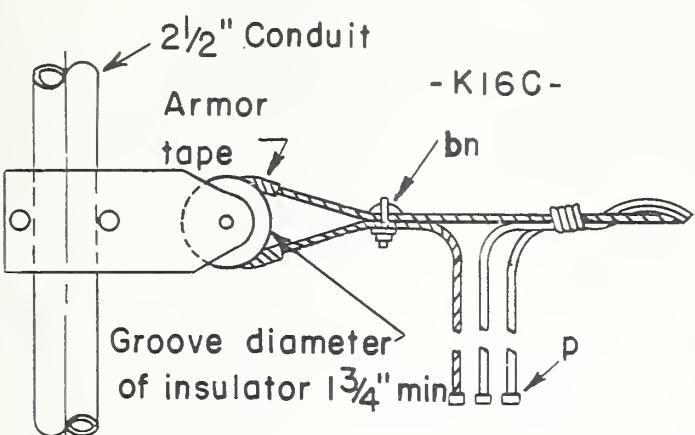
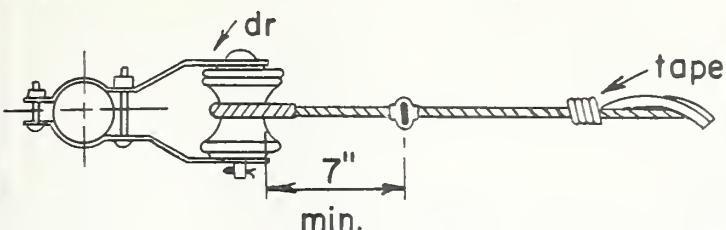
NOTES

This type construction should be used for 3 or 4 conductor service cables with bare A.C.S.R. neutral.

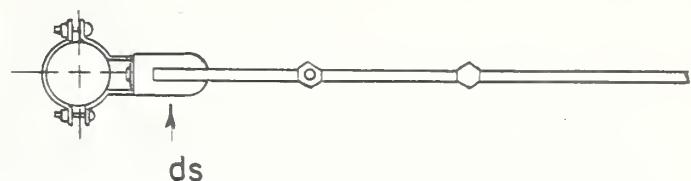
Groove diameter of insulators
1 $\frac{3}{4}$ " minimum for loop deadends.

ITEM	MATERIAL	ITEM	MATERIAL
c	Bolt, machine, $\frac{5}{8}$ " x req'd. length	bn	Clamp, loop deadend
d	Washer, $2\frac{1}{4}$ " x $2\frac{1}{4}$ " x $\frac{3}{16}$ "; $\frac{13}{16}$ " hole	da	Bracket, insulated
o	Bolt, eye, $\frac{5}{8}$ " x req'd. length	os	Clevis, service swinging
s	Clevis, secondary, swinging, insul.	p	Connectors, as required
aa	Nut, eye	dt	Service deadend
ek	Locknuts		

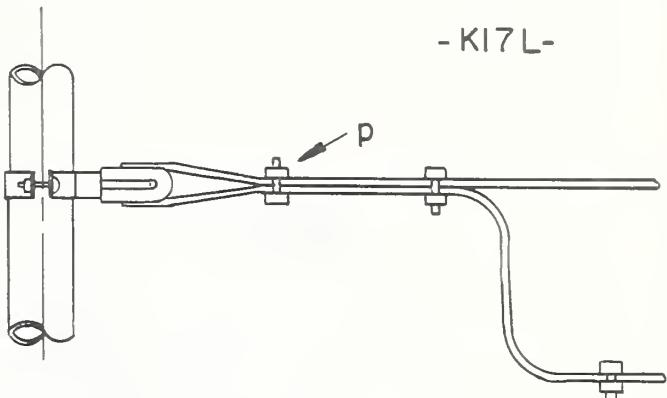
SERVICE ASSEMBLIES, CABLE



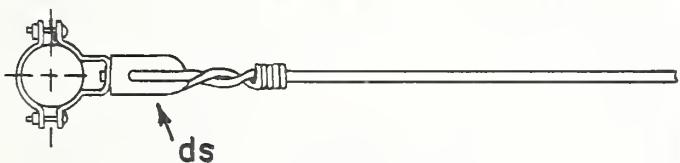
NOTE: This type constr. should be used for three conductor service cables with bare ACSR neutral.



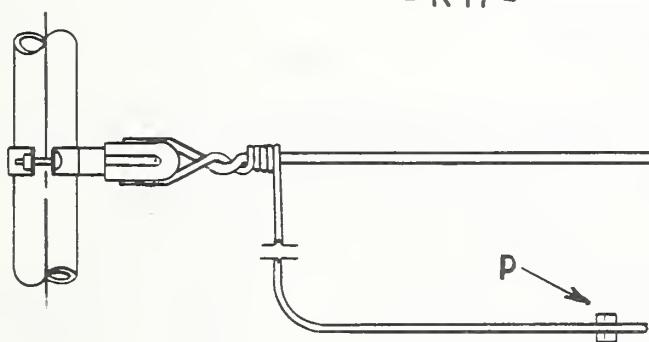
- K17L -



NOTE: This type constr. should be used for No. 2 aluminum weather-proof conductor.



- K17 -

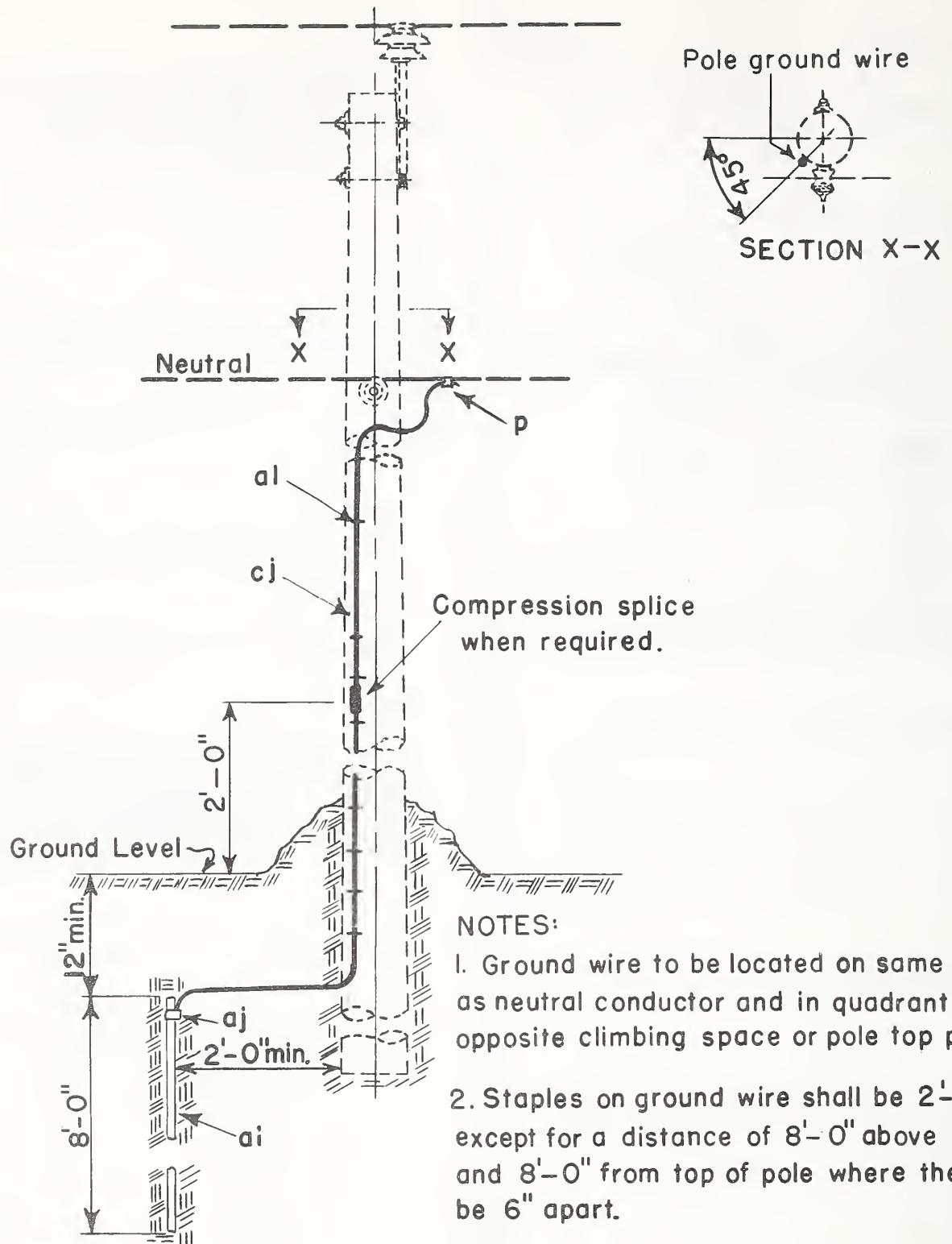


NOTES:

1. Connectors to be applied over bare wire and then taped as req'd.
2. For arrangement of service assembly units see drawing M24-10.

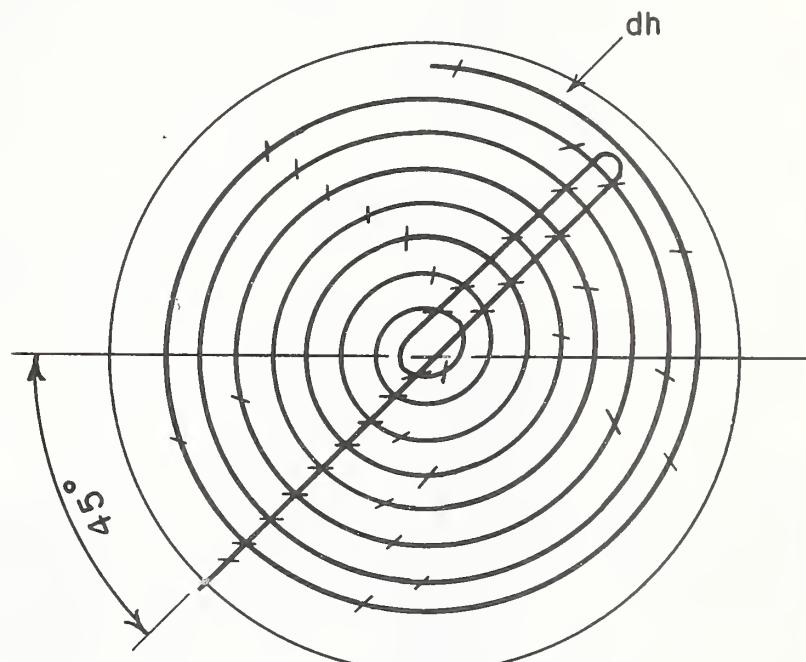
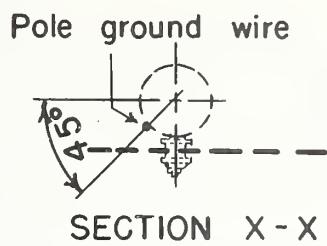
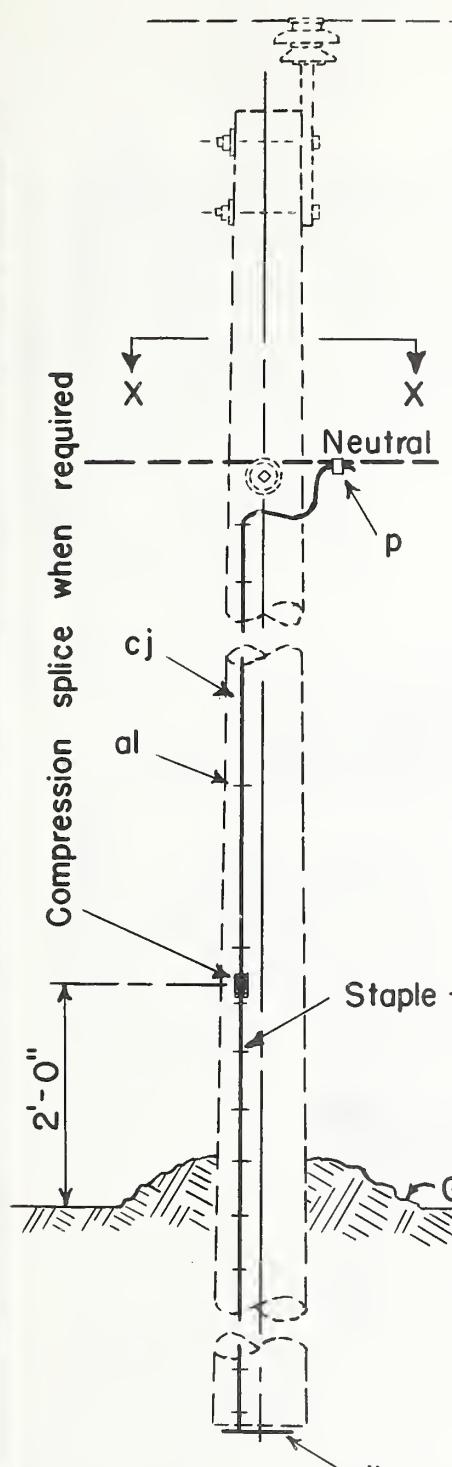
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as req'd	dr		Clevis, conduit insulated
bn		Clamp, loop deadend	ds		Wireholder, conduit

SERVICE ASSEMBLIES (FOR RANCH TYPE HOUSES)



ITEM	NO	MATERIAL	ITEM	NO	MATERIAL
p	1	Connector	cj	1	Ground wire, #6 S.D. Copper or equiv.
ai	1	Rod, ground, 5/8" dia. min.			
aj	1	Clamp, ground rod			
al		Staples, ground wire, 3/16"x 1 1/2" x #9 as req'd.			

GROUNDING ASSEMBLY-GROUND ROD TYPE



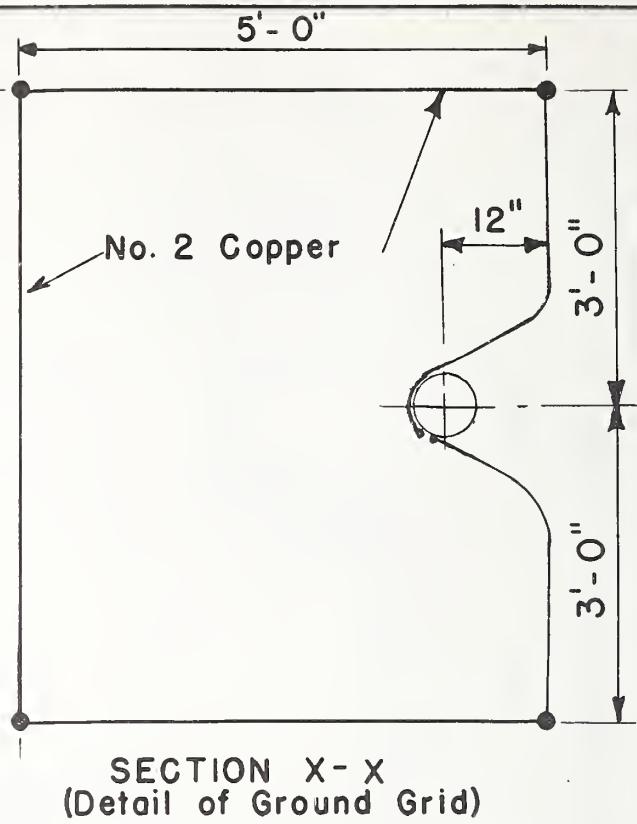
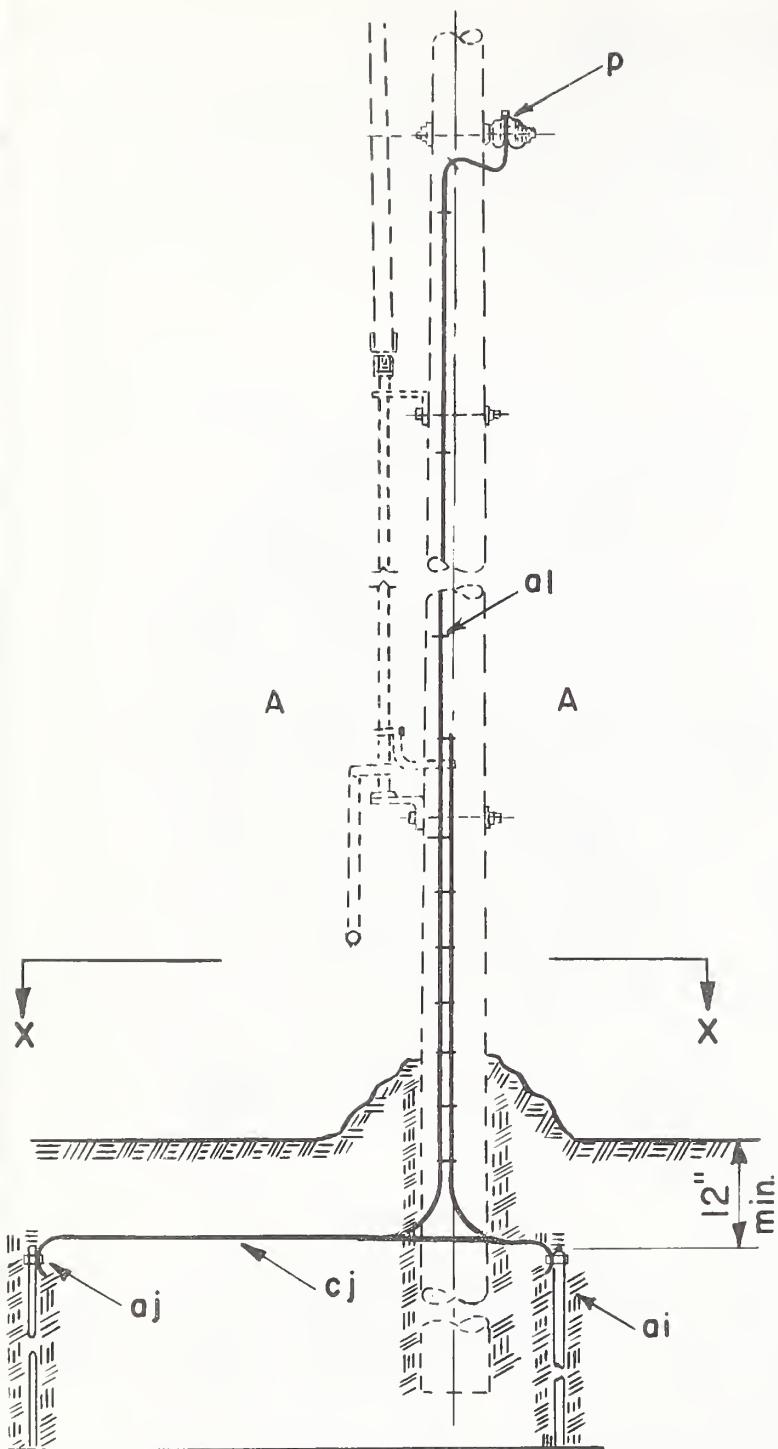
NOTES:

Ground wire to be located on same side as neutral conductor and in quadrant opposite climbing space or pole top pin.

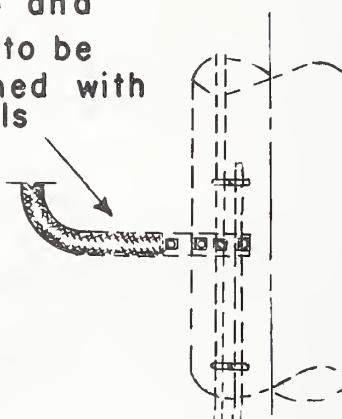
Staples on ground wire shall be 2'-0" apart, except for a distance of 8'-0" above ground and 8'-0" from top of pole where they shall be 6" apart.

ITEM	No.	MATERIAL	ITEM	No.	MATERIAL
p	1	Connector			
al	1	Staples, ground wire, 3/16" x 1 1/2"x#9, as req'd.			
cj	1	Ground wire, #6 S. D. Copper or equivalent			
dh	1	Butt type grounding device, coil or plate			

POLE PROTECTION ASSEMBLY - BUTT TYPE



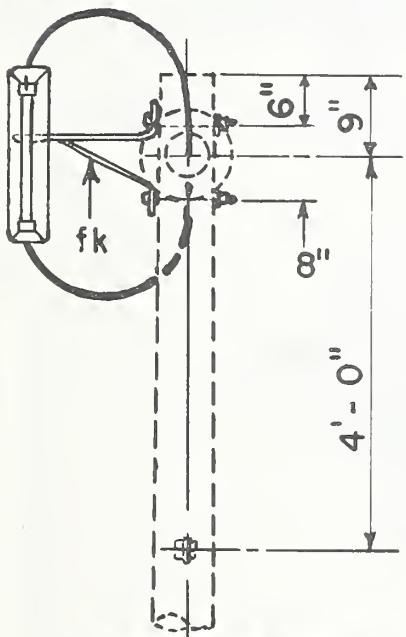
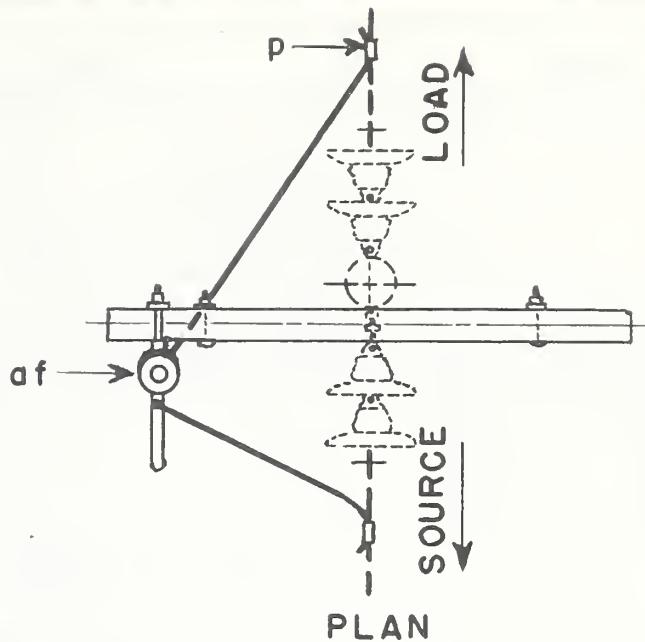
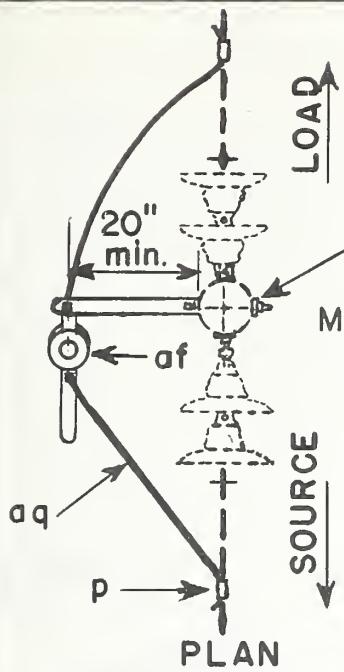
Clamp and
Braid to be
furnished with
controls



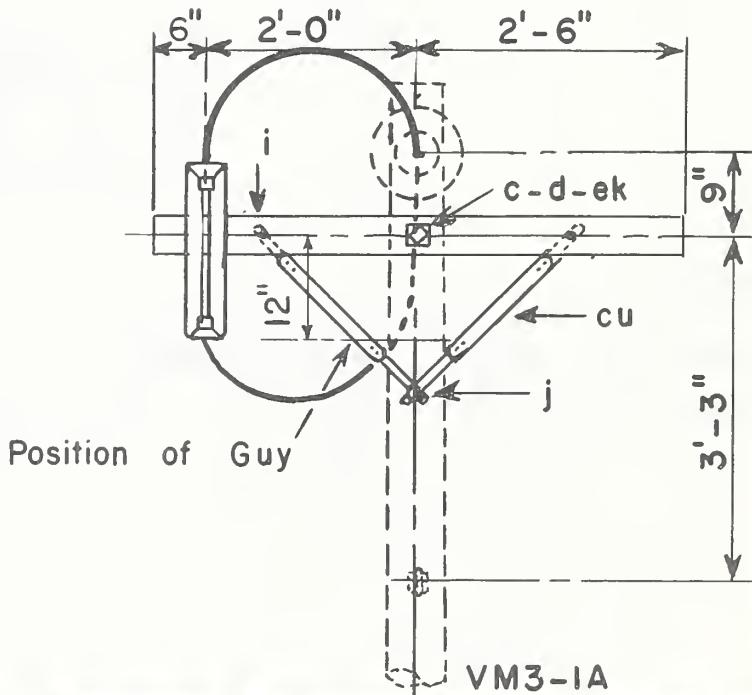
DETAIL OF SECTION A-A

ITEM	NO. REQD.	MATERIAL	ITEM	NO. REQD.	MATERIAL
ai	4	Rod, ground, $\frac{5}{8}$ " dia. min.			
aj	4	Clamp, ground rod			
al		Staples, ground wire, $\frac{3}{16}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ " as reqd.			
cj		Ground wire, #2 S.D. Copper			
p		Connector			

GROUNDING ASSEMBLY-GROUND ROD
TYPE FOR SECTIONALIZING
AIR BREAK SWITCH



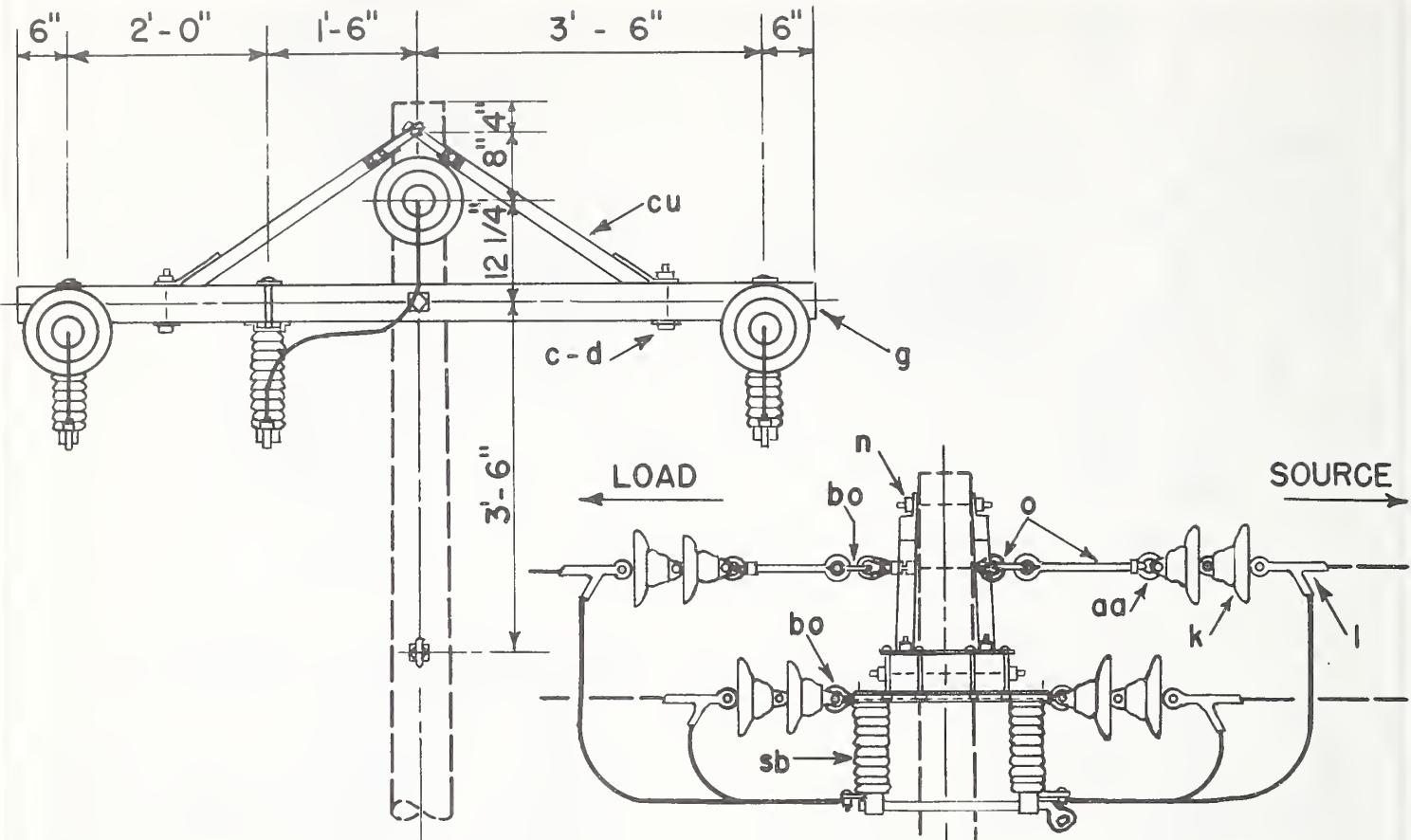
VM3-4



VM3-1A

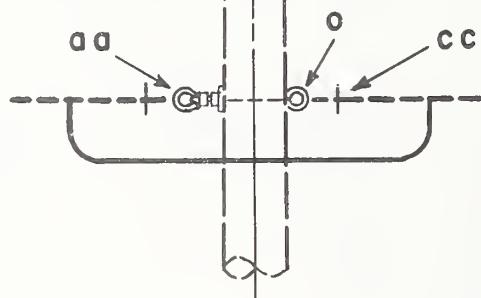
ITEM	MATERIAL	VM3-4	VM3-1A
		NO. REQUIRED	NO. REQUIRED
c	Bolt, machine, 5/8" x required length	2	1
d	Washer, square, 2 1/4"	2	2
g	Crossarm, 3 1/2" x 4 1/2" x 5'-0"		1
i	Bolt, carriage, 3/8" x 4 1/2"		2
j	Screw, lag, 1/2" x 4"		1
p	Connector, compression type	2	2
af	Cutout, fuse, single shot	1	1
aq	Leads or jumpers as required		
cu	Brace, wood, 28"		2
ek	Locknuts		
fk	Bracket, extension	1	

14.4/24.9 KV., 1-PHASE
ONE SECTIONALIZING FUSE CUTOUT



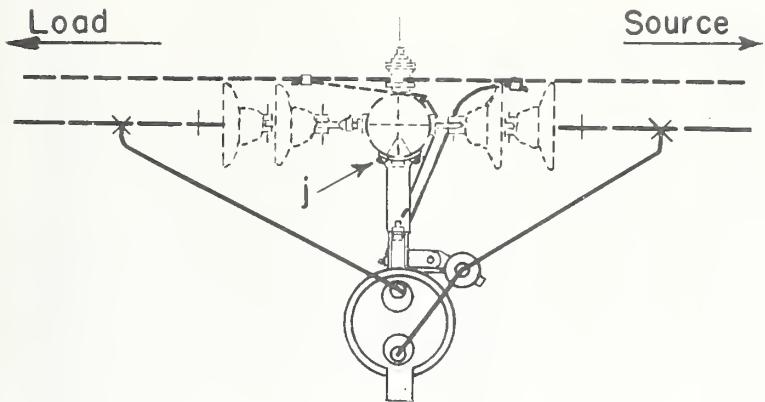
Note:

For V-phase installations omit switch and related items on center phase. Designate as VM3-2.



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c 4	Bolt, machine, 1/2" x req'd. length	aa	Jumpers, as required
d 4	Washer, round, 1 3/8" dia.	bo 6	Shackle, anchor
d 3	Washer, square, 2 1/4"	cc 2	Deadend assembly, neutral
g 2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	cu 2	Brace, crossarm, wood, 60" span
l 6	Clamp, deadend	ek	Locknuts
n 2	Bolt, double arming, 5/8" x req'd. lgth.	sb 3	Switch, disconnect, 25 KV, with mounting hardware
o 4	Bolt, eye, 5/8" x required length		
p	Connectors, as required		
aa 4	Nut, eye, 5/8"		

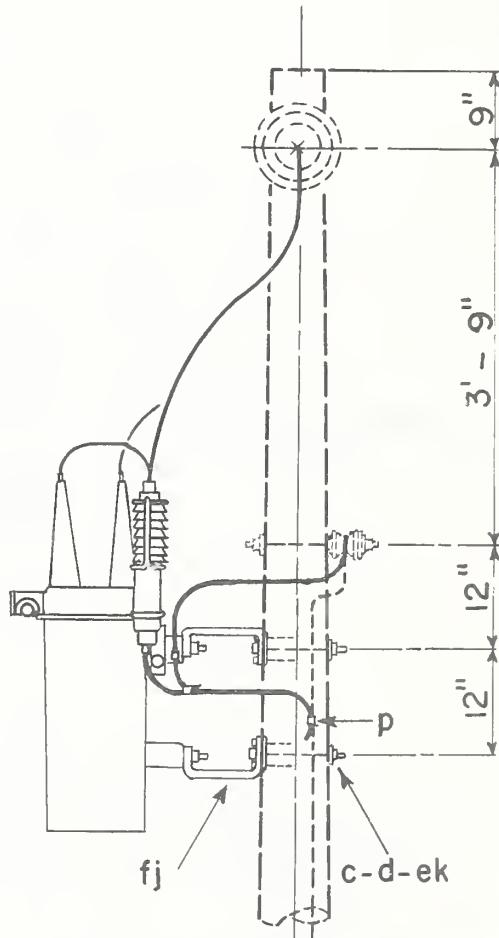
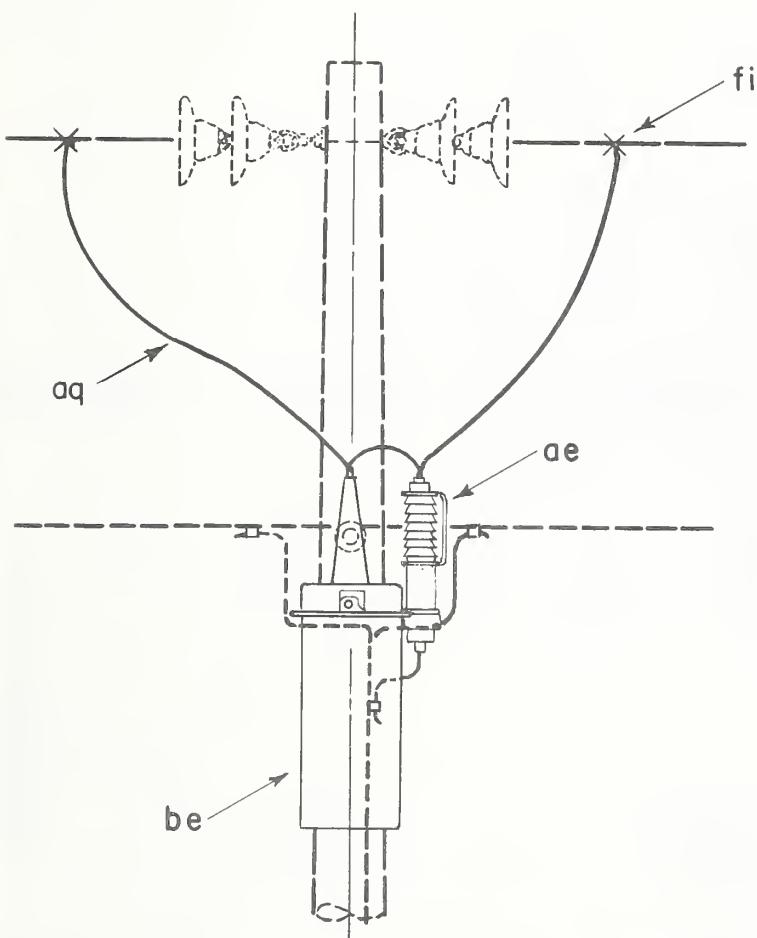
14.4 / 24.9 KV
TWO OR THREE SECTIONALIZING
DISCONNECT SWITCHES



PLAN

Note:

The recloser terminal bushing connected directly to the coil should be connected to the source.



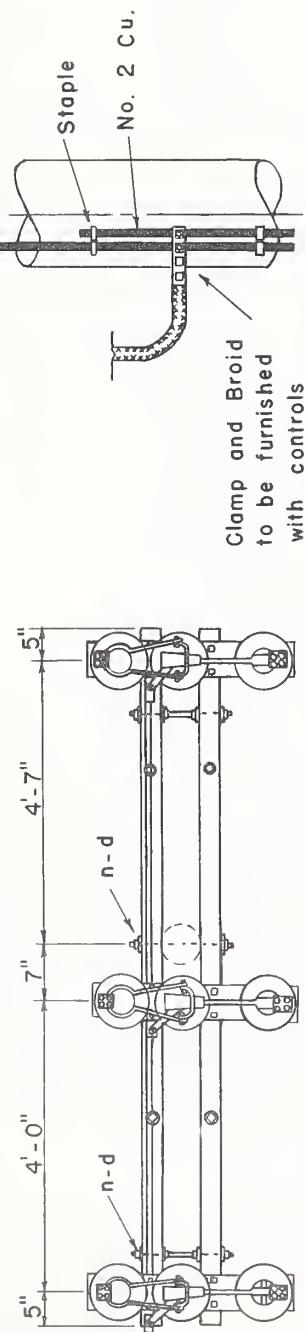
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c	2	Bolt, machine, 5/8"x req'd. length	be	1	Recloser, oil circuit
d	2	Washer, square, 2 1/4"	ek		Locknuts
j	4	Screw, lag, 1/2"x 4"	fi	2	Connector, hot line
ae	1	Arrester, lightning	fj	2	Bracket, extension, 9" long
aq		Jumpers or leads as required	p		Connectors, as required

14.4 / 24.9 KV
ONE SECTIONALIZING OIL CIRCUIT RECLOSE

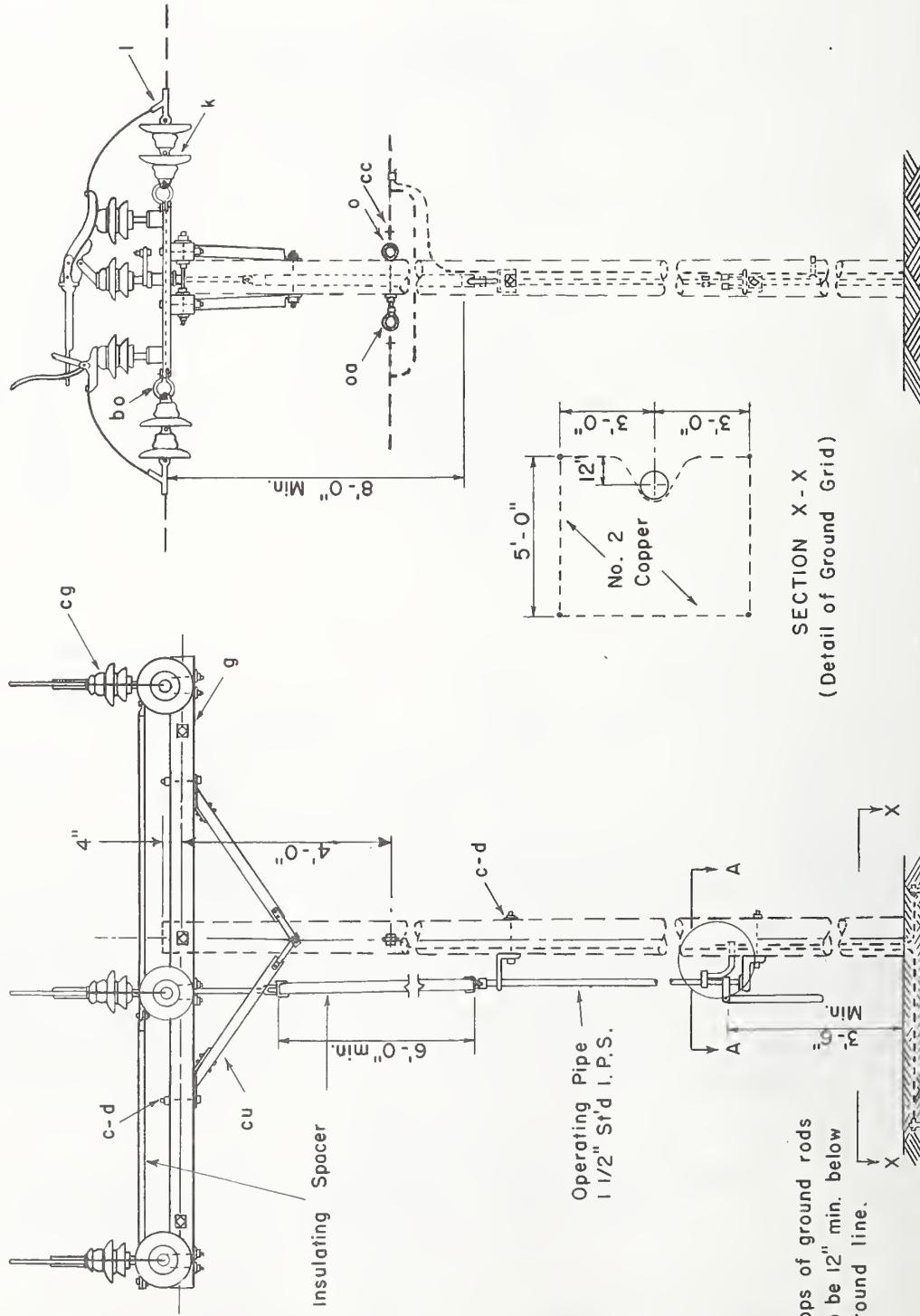
MATERIAL

ITEM NO	MATERIAL
c 14	Bolt, machine, $5/8'' \times$ req'd length
c 4	Bolt, machine, $1/2'' \times$ req'd length
d 25	Washer, $2-1/4'' \times 2-1/4'', 13/16''$ hole
d 4	Washer, rd., $1-3/8''$ dia, $9/16''$ hole
g 2	Crossarm, $3-3/4'' \times 4-3/4'' \times 10'-0''$
k 12	Insulator, suspension, 10"
l 6	Clamp, deadend
n 4	Bolt, double arming, $5/8'' \times$ req'd length
bo 6	Shackle, anchor
cg 1	Switch, airbreak, 3 pole unit
cu 1	Brace, wood, 60" span
cc 2	Deadend assembly, neutral
o 1	Bolt, eye, $5/8''$
aa 1	Nut, eye, $5/8''$
ek	Locknuts

Note:
For grounding assembly, see
drawing M2-15



DETAIL OF A-A



14.4/24.9 KV. PRIMARY, 3-PHASE 4-WIRE STAR SECTIONALIZING AIR BREAK SWITCH

Jan. 1, 1963

VM3-16

MATERIAL

ITEM REQ.

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

*

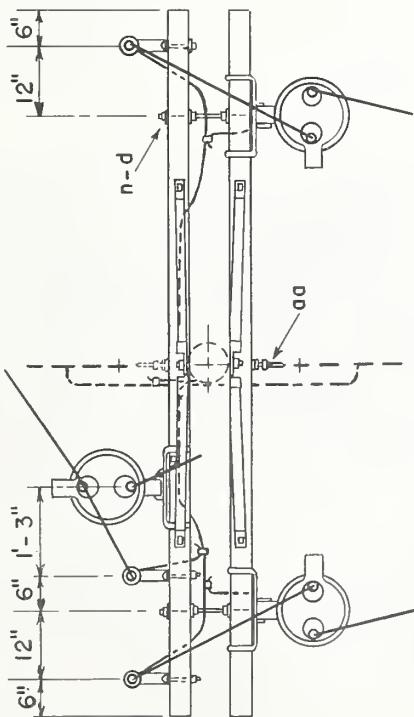
*

*

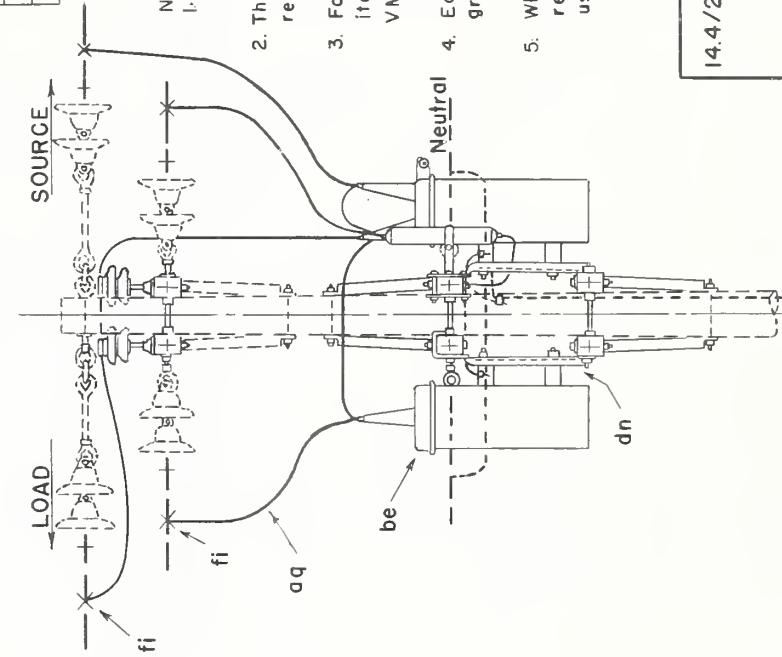
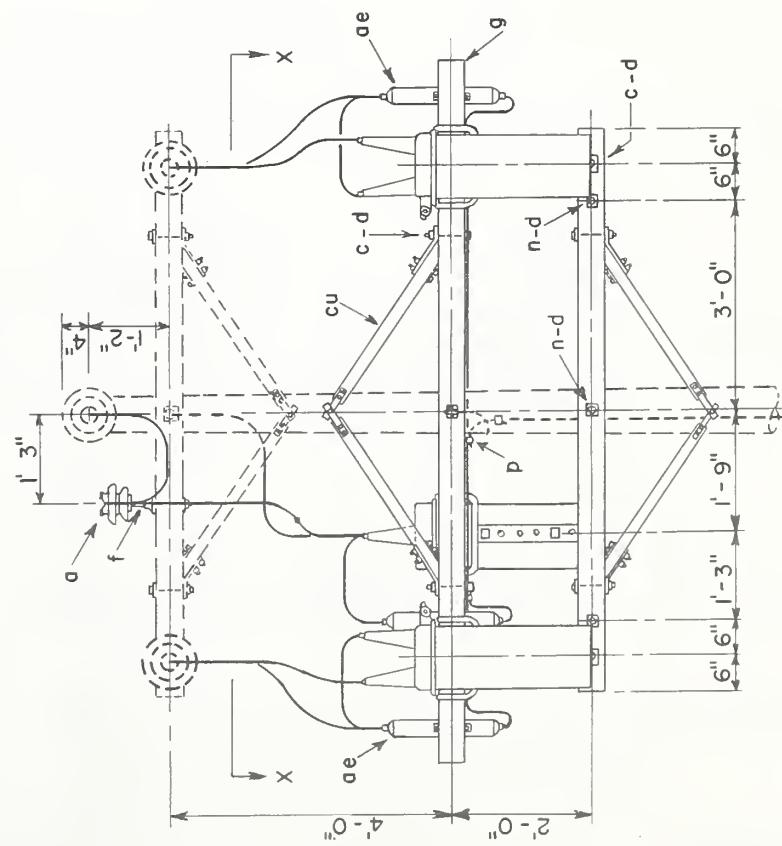
*

*

*



SECTION X-X



ITEM	REQ.	MATERIAL
a	2	Insulator, pin type
c	3	Bolt, machine, 5/8" x req'd length
c	8	Bolt, machine, 1/2" x req'd length
d	23	Washer, square 2 1/4"
d	8	Washer, 1 3/8" diam., 9/16" hole
f	2	Pin, crossarm, steel, 5/8" x 14"
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
n	8	Bolt, double arming, 5/8" x req'd lg'th
p		Connectors, as required
aa	1	Nut, eye, 5/8"
fi	6	Connector, hot line, tap assembly
qq		Jumpers or leads, as required
ae	3	Lightning arrester
be	3	Recloser, oil circuit
cu	4	Brace, wood, 60" span
dn	3	Hanger, T-Crossarm, as required

*

* Specify this item to be furnished by the manufacturer.

Notes:
1. The recloser terminal bushing connected directly to the coil should be connected to the source.

2. The two 10-Inch suspension insulators shown may be replaced by three 6-inch insulators.

3. For V-Phase installations omit recloser and related items on center phase. Designate as assembly VM 3-19.

4. Each recloser tank shall have two connections to ground.

5. Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

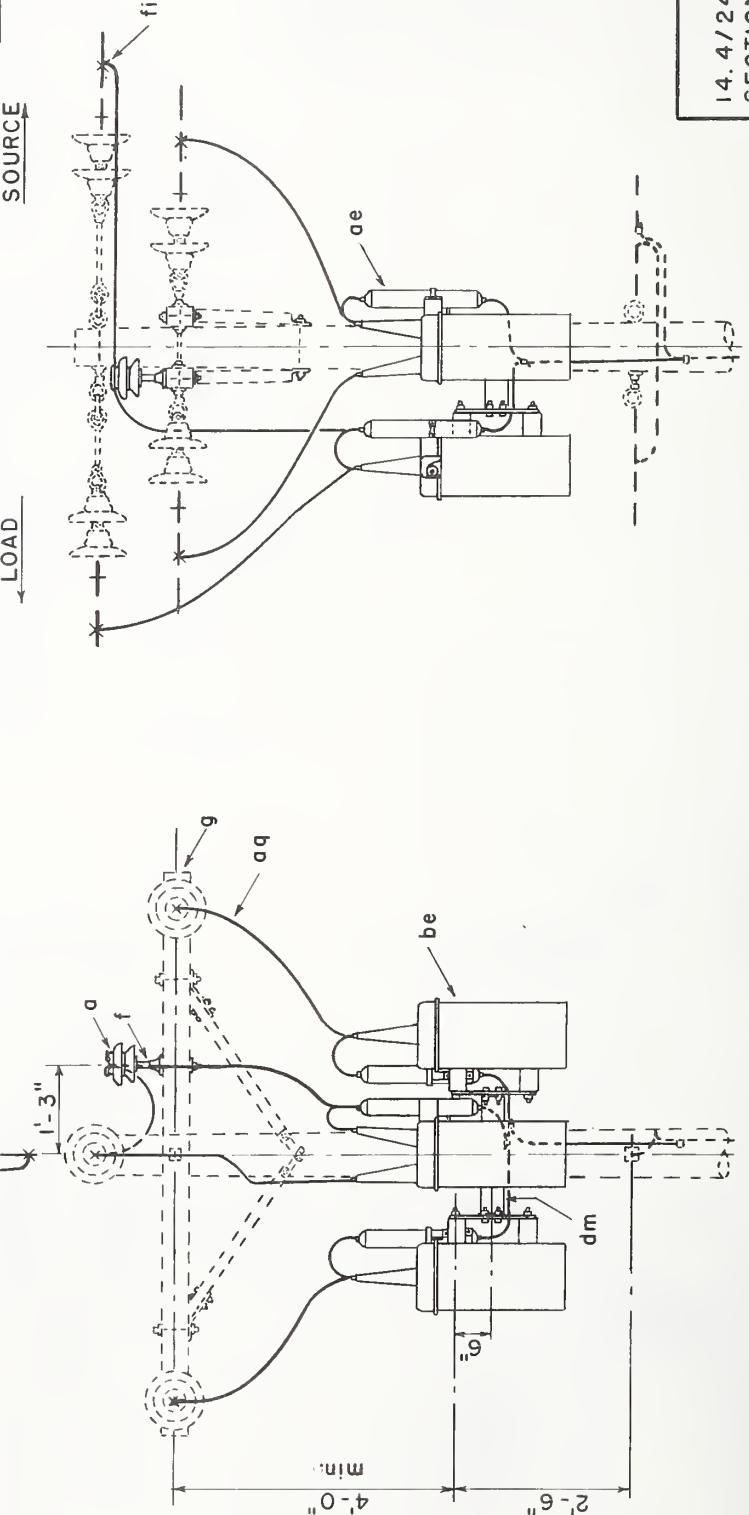
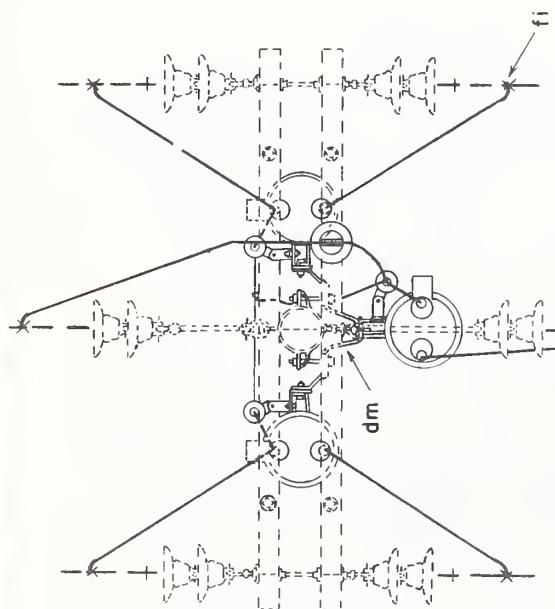
14.4/24.9KV. TWO OR THREE SECTIONALIZING OIL CIRCUIT RECLOSERS

VM 3-19, VM 3-20

Jan. 1, 1963

ITEM NO.	MATERIAL
a	1 Insulator, pin type
f	1 Pin, crossarm, steel, 5/8" x 14"
p	Connectors, as required
ae	3 Lightning arrester
fi	6 Connector, hat line
aq	Jumpers or leads as required
be	3 Recloser, oil circuit
dm	1 Bracket, cluster type, with 14" - adapter plate

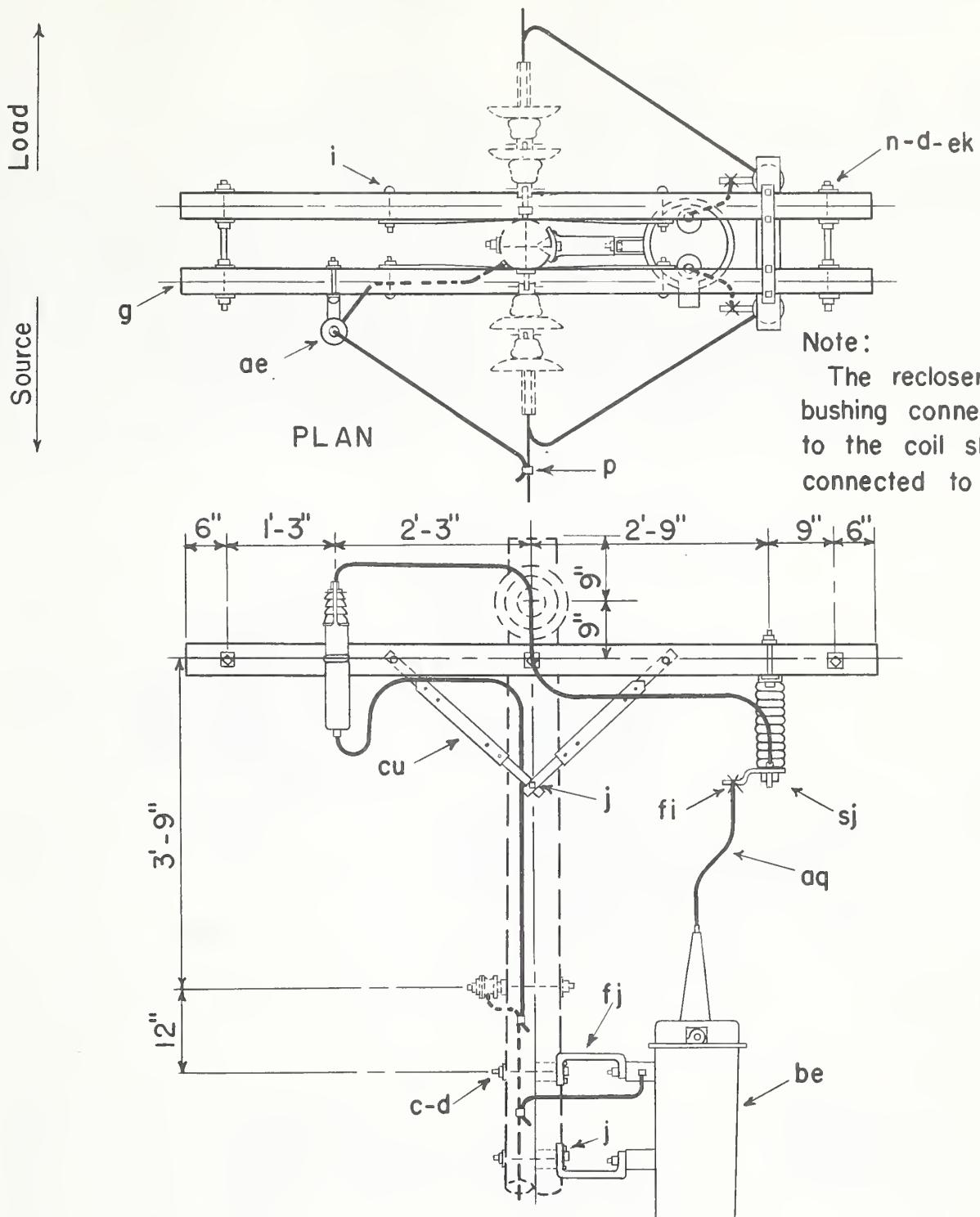
- Notes: 1. The recloser terminal bushing connected directly to the coil should be connected to the source.
2. The two 10-inch suspension insulators shown may be replaced by three 6-inch insulators.
3. For V-Phase installations omit recloser and related items on center phase. Designate as assembly VM 3-19A.
4. Each recloser tank shall have two connections to ground.



14.4/24.9 KV. TWO OR THREE SECTIONALIZING OIL CIRCUIT RECLOSERS

Jan.1, 1963

VM3-19A, VM3-20A



ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c	2	Bolt, machine, 5/8" x req'd. length	p		Connectors, as required
d	12	Washer, square, 2 1/4"	ae	1	Lightning arrester
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	fi	2	Connector, hot line
cu	4	Brace, wood, 28"	sj	1	Switch, recloser, by-pass
i	4	Bolt, carriage, 3/8" x 4 1/2"	aq		Leads or jumpers, as required
j	6	Screw, lag, 1/2" x 4"	be	1	Recloser, oil circuit
ek		Locknuts	n	3	Bolt, double arming, 5/8" x req'd. lgth.

14.4/24.9 KV
ONE SECTIONALIZING OIL CIRCUIT RECLOSE
WITH BY-PASS SWITCH

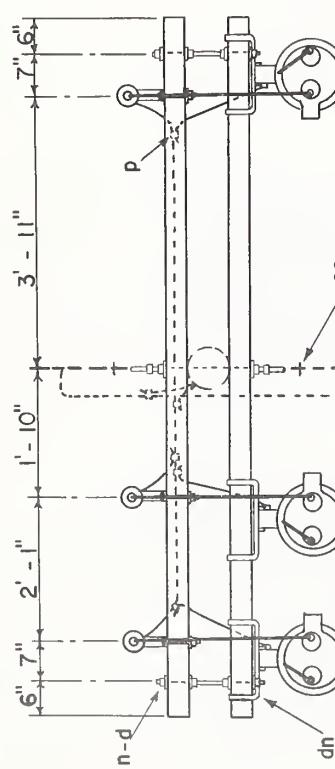
ITEM	N.O.	MATERIAL
c	10	Bolt, machine, $1\frac{1}{2}$ " x req'd. length
c	14	Bolt, machine, $5\frac{1}{8}$ " x req'd. length
d	10	Washer, round, 1 $\frac{3}{8}$ " dia.
d	14	Washer, square, 2 $\frac{1}{4}$ "
g	2	Crossarm, 3 $1\frac{1}{2}$ " x 4 $1\frac{1}{2}$ " x 8'-0"
g	3	Crossarm, 3 $3\frac{1}{4}$ " x 4 $3\frac{1}{4}$ " x 10'-0"
k	12	Insulator, suspension, 10"
l	6	Clamp, deadend
n	6	8alt, double arming, 5/8" x req'd. length
o	3	Bolt, eye, 5/8"
p		Connectors, as required
oo	5	Nut, eye, 5/8"
ae	3	Lightning arrester
aq		Jumpers, as required
be	3	Reclaser, oil circuit
bo	6	Shackle, anchor
cc	2	Deadend assembly, neutral
cu	5	Brace, crossarm, waad, 60" span
dn	3	Hanger, T - crassarm, as required *
ek		Lacknults
fi	6	Connector, hot line
si	3	Switch, recloser, by-pass

- * Specify this item to be furnished by the recloser manufacturer.
- Notes:
- The recloser terminal bushing connected directly to the coil should be connected to the source.
 - For V-Phase installations omit recloser and related items on center phase. Designate as VM3-24.
 - Each recloser tank shall have two connections to ground.
 - Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

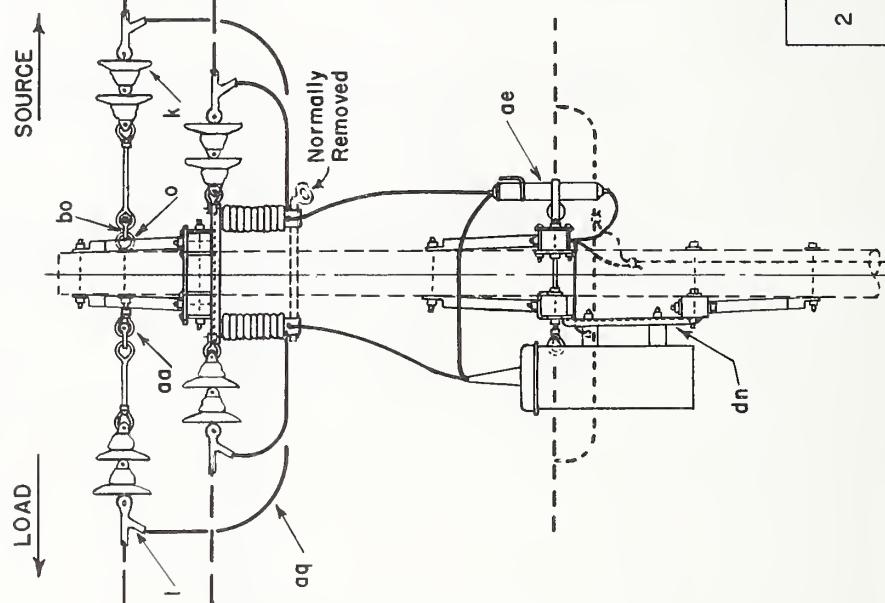
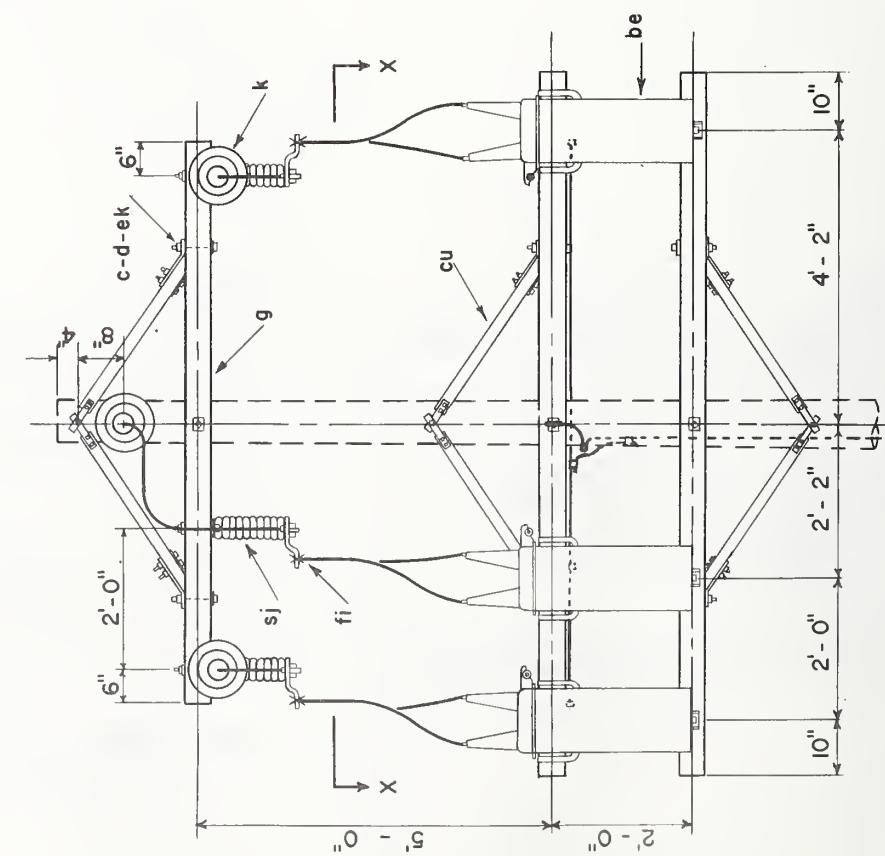
14.4 / 24.9 KV
2 or 3 SECTIONALIZING OIL CIRCUIT RECLOSERS
WITH BY-PASS SWITCHES

Jan. 1, 1963

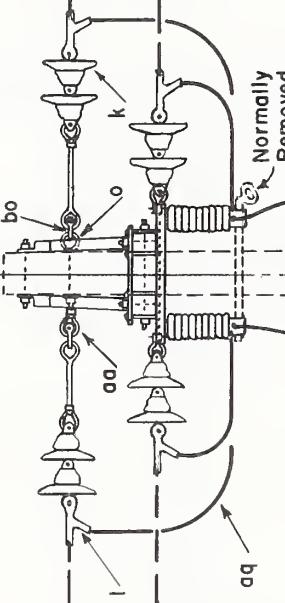
VM3-24, VM3-25



SECTION X X

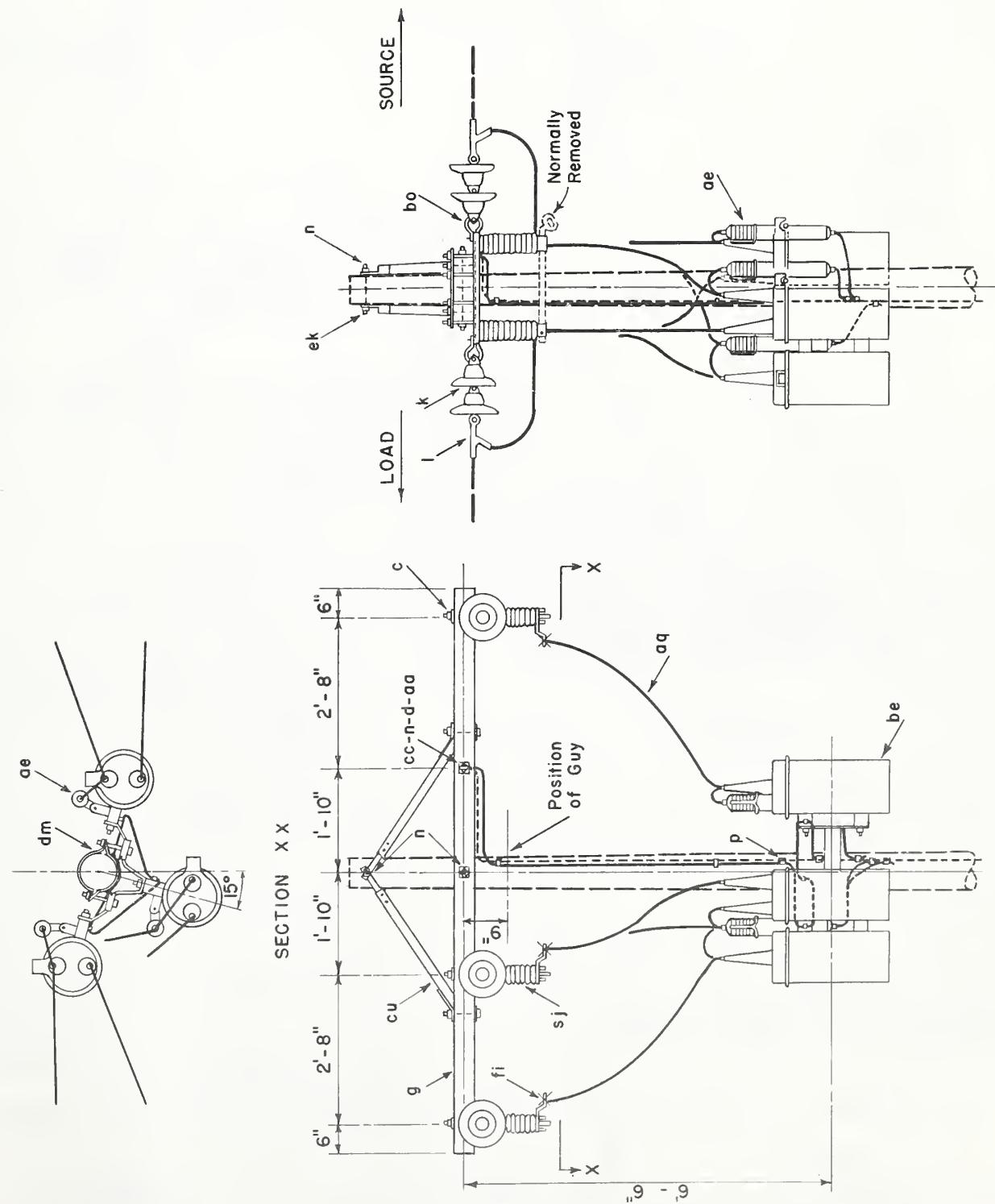


SOURCE →
LOAD ←

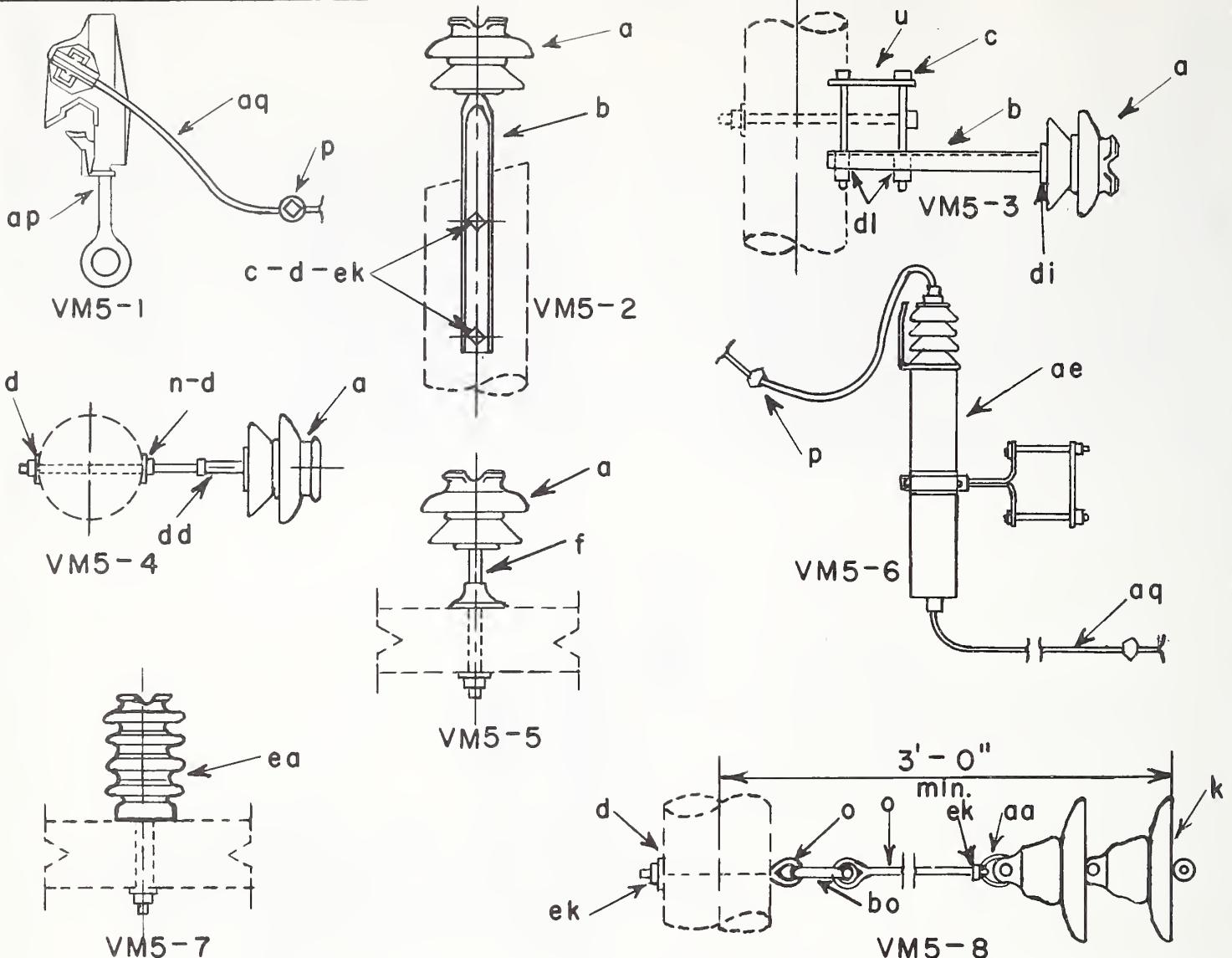


ITEM NO.	MATERIAL
c 12	Bolt, machine, 5/8" x required length
c 4	Bolt, machine, 1/2" x required length
d 6	Washer, square, 2 1/4"
d 4	Washer, round, 1 3/8" dia.
d 2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
k 12	Insulator, suspension, 10"
l 6	Clamp, deadend
n 3	Bolt, double arming, 5/8" x req'd length
p	Connectors, as required
aa 2	Nut, eye, 5/8"
ae 3	Lightning arrester
aq	Jumpers, as required
be 3	Recloser, oil circuit
bo 6	Shackle, anchor
cc 2	Deadend assembly, neutral
cu 2	Brace, crossarm, wood, 60" span
dm 1	Bracket, cluster type, with adapter plate as req'd.
ek	Locknuts
fi 6	Connectar, hot line, tap assembly
sj 3	Switch, recloser by-pass

- Notes:
1. The recloser terminal bushing connected directly to the coil should be connected to the source.
 2. For V-Phase installations omit recloser and related items on center phase. Designate as VM3-24A.
 3. Each recloser tank shall have two connections to ground.
 4. Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

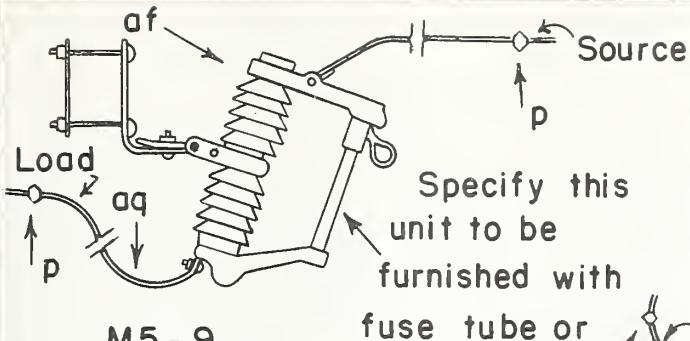


14.4 / 24.9 KV	
2 or 3 SECTIONALIZING OIL CIRCUIT RECLOSERS	
WITH BY-PASS SWITCHES	
Jan. 1, 1963	VM3-24A, VM3-25A

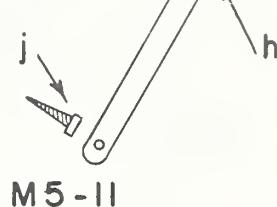
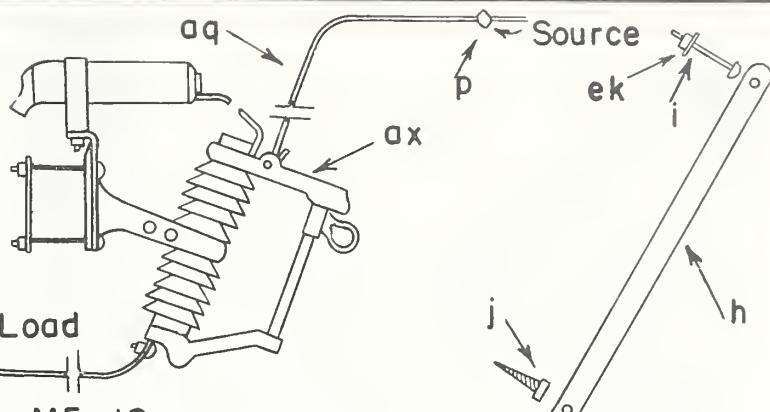


ITEM	MATERIAL	VM5-1	VM5-2	VM5-3	VM5-4	VM5-5	VM5-6	VM5-7	VM5-8
a	Insulator, pin type		1	1	1	1			
b	Pin, pole top		1-20"	1-15"					
c	Bolt, machine, 5/8" x req'd length	2	2						
d	Washer, 2 1/4" sq.	2		2				1	
f	Pin, crossarm, steel, 5/8" x 14"					1			
k	Insulator, suspension								2
n	Bolt, double arming, 5/8" x req'd length					1			
o	Bolt, eye, 5/8" x req'd length								2
p	Connector	1					2		
u	Clamp, guy, 3 bolt type			1/2					
aa	Nut, eye, 5/8"								1
ae	Lightning arrester						1		
ap	Clamp, hot line	1							
aq	Jumper	1					2		
bo	Shackle, anchor								1
dd	Adapter, insulator					1			
di	Adapter, thimble, 1" to 1 3/8"			1					
dl	Pipe spacer, pole pin			2					
ea	Insulator, post type, 7" stud	2	2	3				1	
ek	Locknuts								2

14.4/24.9 KV.
MISCELLANEOUS PRIMARY ASSEMBLIES

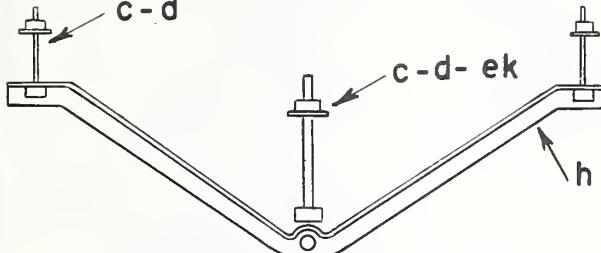


Specify this unit to be furnished with fuse tube or switch blade.



c-d

c-d-ek



ek

c-d

c-d-ek

cu

c-d-ek

g

M5-13

c-d-ek

g

4'-0"

4'-0"

M5-14, M5-15

c-d-ek

g

5'-0"

5'-0"

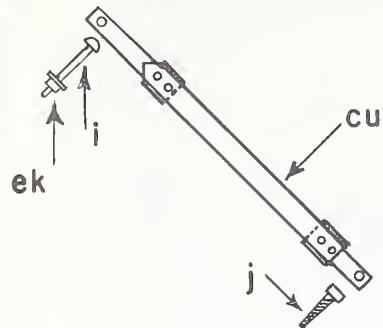
M5-16

ITEM	MATERIAL	NUMBER REQUIRED							
		M5-9	M5-10	M5-11	M5-12	M5-13	M5-14	M5-15	M5-16
c	Bolt, machine, 5/8" x req'd length				1	1	1	1	
c	Bolt, machine, 1/2" x req'd length				2	2			
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole				1	1	2	2	2
d	Washer, round, 1 3/8" dia., 9/16" hole				2	2			
g	Crossarm, 3 1/2" x 4 1/2" x 8'-0"						1		
g	Crossarm, 3 3/4" x 4 3/4" x 10'-0"								1
h	Brace, flat, 1 1/4" x 1/4" x 28"			1					
h	Brace, angle, 1 1/2" x 1 1/2" x 3/16", 60" span					1			
i	Bolt, carriage, 3/8" x 4 1/2"			1					
j	Screw, lag, 1/2" x 4"			1					
p	Connector	2	2						
af	Cutout, single-shot	1							
aq	Jumper	2	2						
ax	Cutout and arrester combination			1					
cu	Brace, wood, 60" span					1			
ek	Locknuts				1	3	3	1	1
g	Crossarm, 3 3/4" x 4 3/4" x 8'-0"						1		

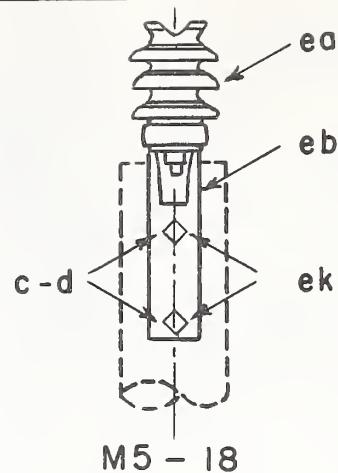
MISCELLANEOUS PRIMARY ASSEMBLIES

Jan 1, 1962

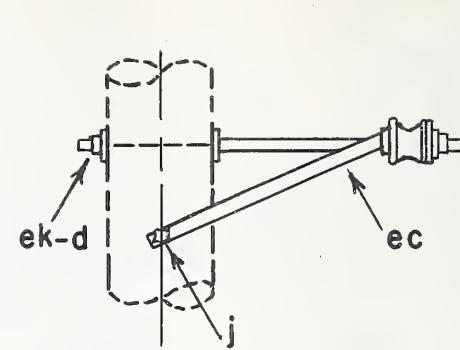
M5-9 TO 16



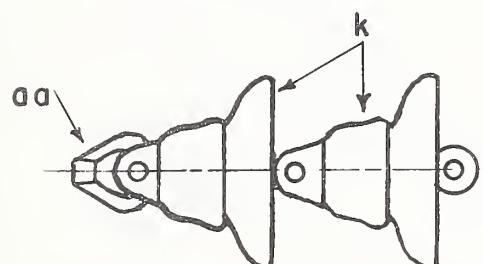
M5 - 17



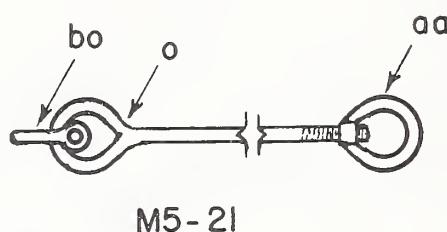
M5 - 18



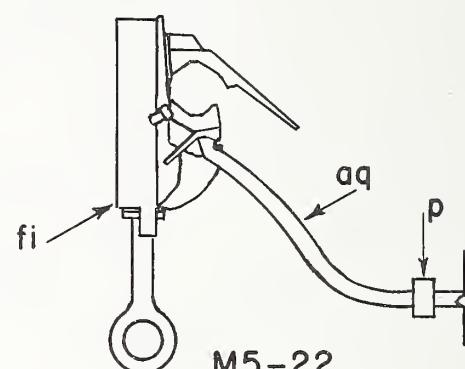
M5 - 19



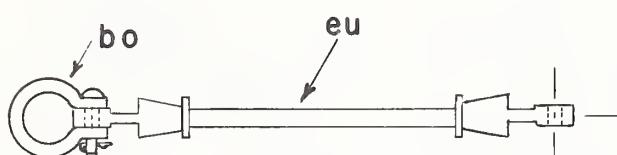
M5 - 20



M5-21



M5-22



M5 - 23

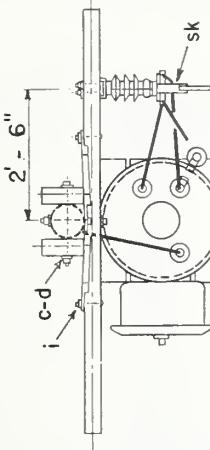
ITEM	MATERIAL	M5-17	M5-18	M5-19	M5-20	M5-21	M5-22	M5-23
c	Bolt, machine, 5/8"x required length		2					
d	Washer, 2 1/4" square		2	1				
i	Bolt, carriage, 3/8"x 4 1/2"	1						
j	Screw, lag, 1/2" x 4"	1		2				
k	Insulator, suspension					2		
ea	Insulator, post type, 1 3/4" stud		1					
eb	Bracket, for post type insulator		1					
ec	Bracket, offset, neutral, insulated			1				
ek	Locknuts	1	2	1				
cu	Brace, wood, 28"	1				1	1	
aa	Eye nut					1	1	
bo	Shackle, anchor					1		1
o	Bolt, eye, 5/8" x req'd. length					1		
fi	Connector, hot line						1	
aq	Jumper						1	
p	Connector						1	
eu	Link, extension, insulated							1

MISCELLANEOUS PRIMARY ASSEMBLIES

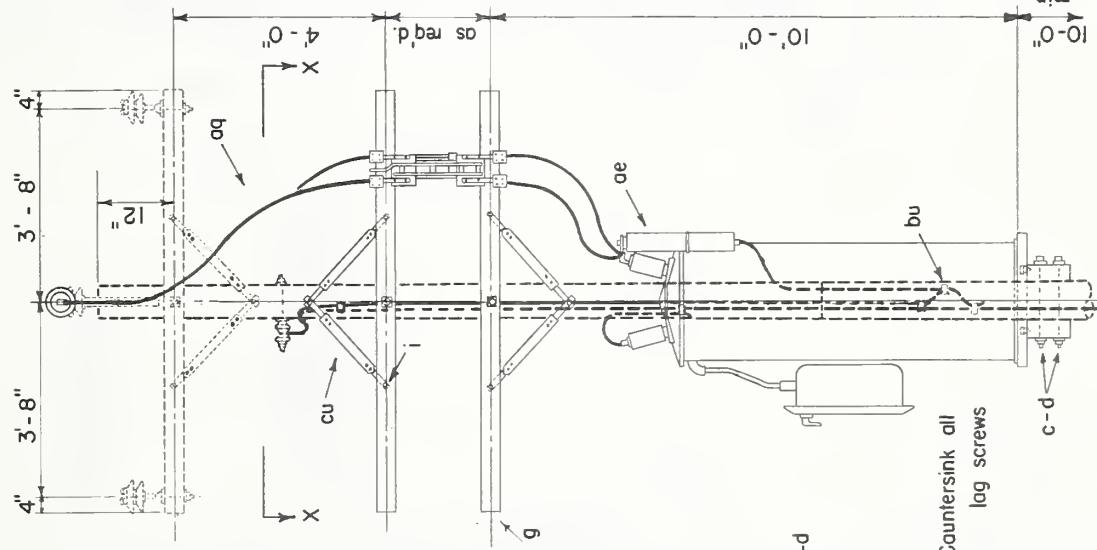
Jan. 1, 1962

M5-17 TO 23

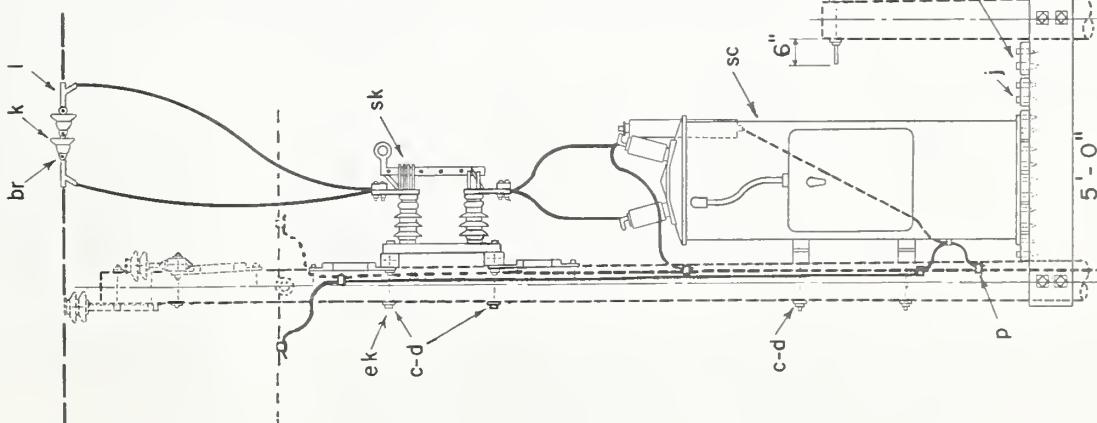
ITEM NO.	MATERIAL
c 4	Bolt, machine, 1/2" x req'd. length
c 5	Bolt, machine, 5/8" x req'd. length
c 4	Bolt, machine, 3/4" x req'd. length
d 4	Washer, round, 1 3/8"
d 16	Washer, square, 2 1/4"
g 2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
l 4	Bolt, carriage, 3/8" x 4 1/2"
l 2	Screw, lag, 1/2" x 5", as req'd.
l 2	Clamp, deadend
p	Connectors, as req'd.
oe 1	Lightning arrester
oe 1	By-pass arrester
q	Leads or jumpers, as req'd.
br 1	Crain link, 5/8" x 3/4"
* bu 1	Connector, solderless
cu 4	Brace, wood, 28'
sc 1	Regulator, step type
sk 1	Regulator by-pass switch
k 2	Insulator, suspension, 6"
h 2	Structural timber, 4" x 10" x 6'-0"
planks, 2' or 3" thick, length as req'd	Planks, 2' or 3" thick, length as req'd
e k	Locknuts



SECTION X-X



WIRING DIAGRAM

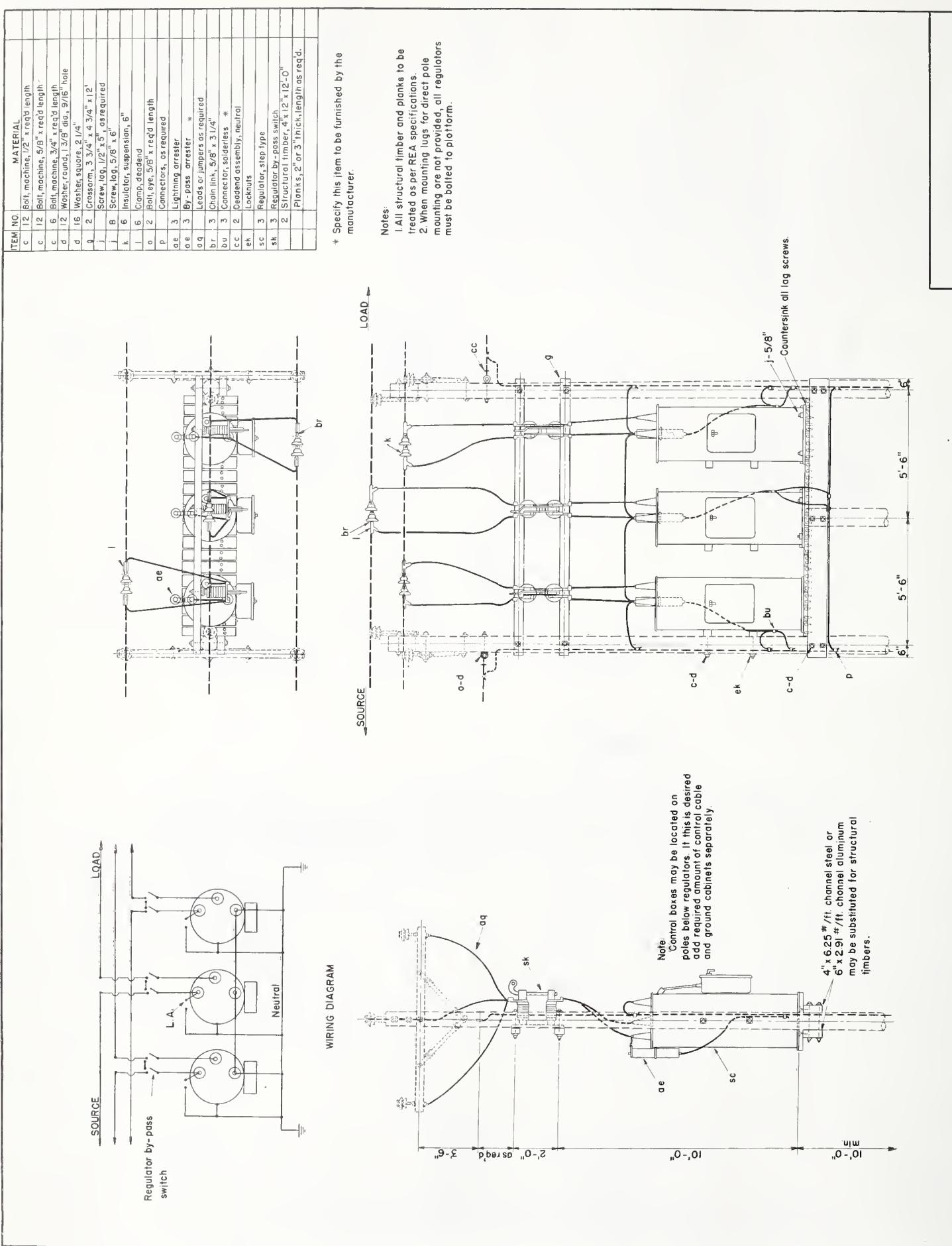


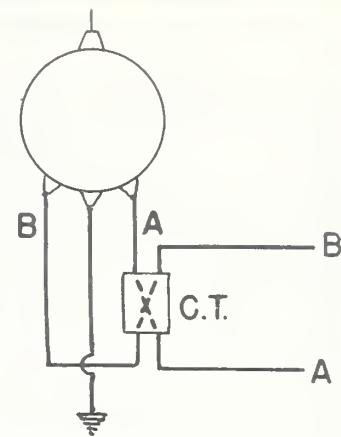
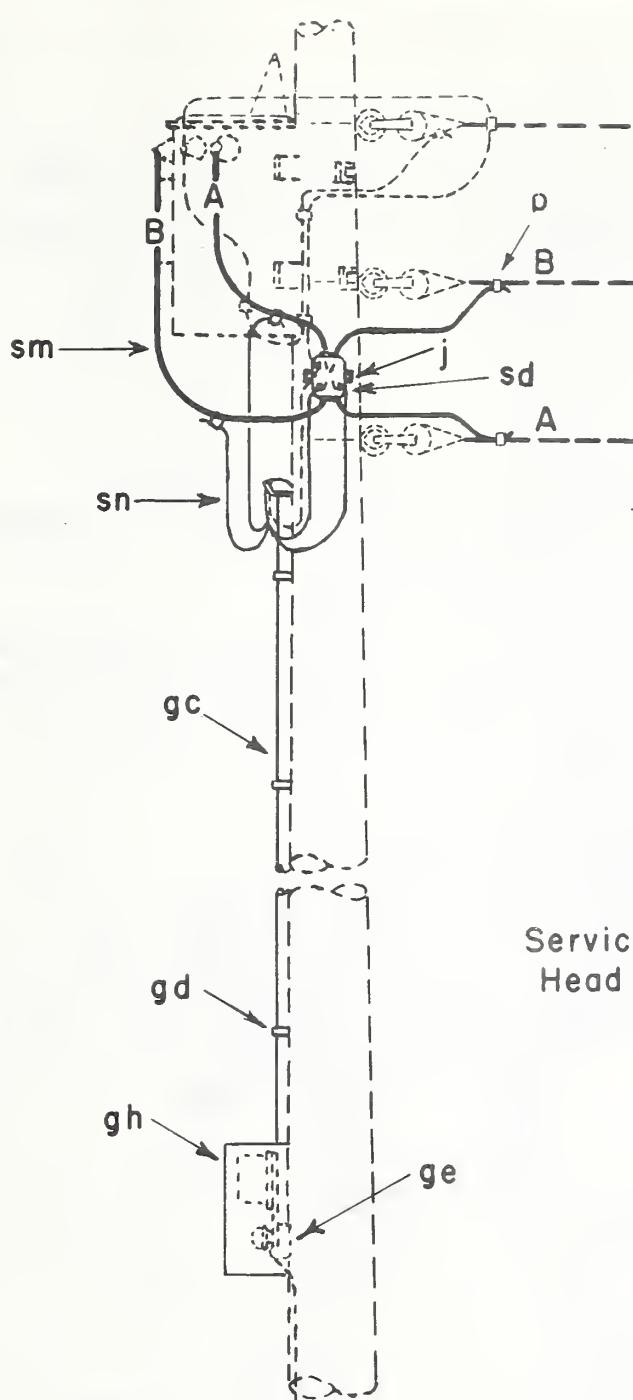
Note:
All structural timber and planks to be
treated per REA specification

14.4/24.9 KV
ONE STEP VOLTAGE REGULATOR
PLATFORM MOUNTED

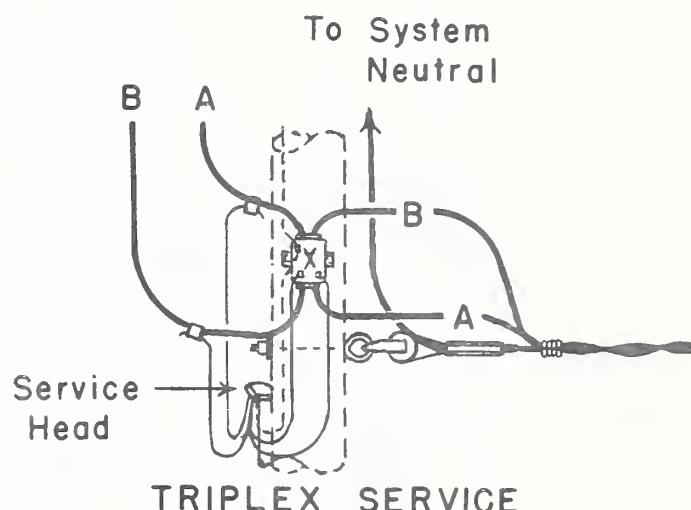
Jan. 1, 1963

VM7-1



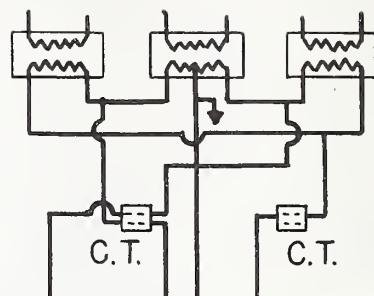
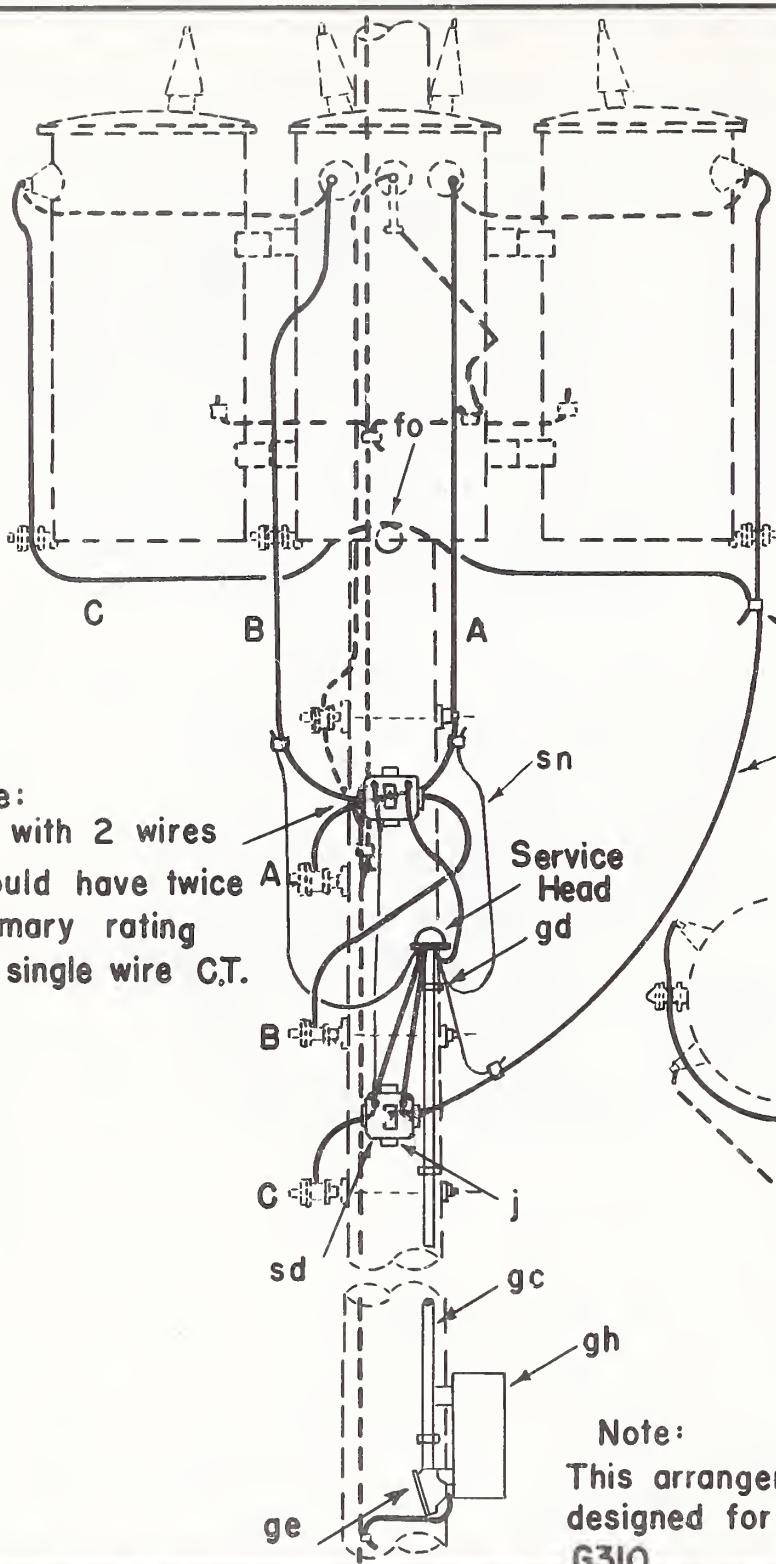


Note: **WIRING DIAGRAM**
For more detailed wiring diagram,
see REA Bulletin 161-12



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
j 2	Screw, lag, 1/2" x 4"	sd 1	Transformer, current
p	Connectors, as required	sm	Wire, No. 12, insul. for current
gc	Conduit, 1 1/4", as required	sn	Wire, No. 14, insul. for potential
gd	Straps, conduit, as required	l	Service head
ge 1	Condulet, type "LB"		
gh 1	Meter box, meter and test block		

**SECONDARY METERING GUIDE
SINGLE PHASE 120 / 240 VOLTS**

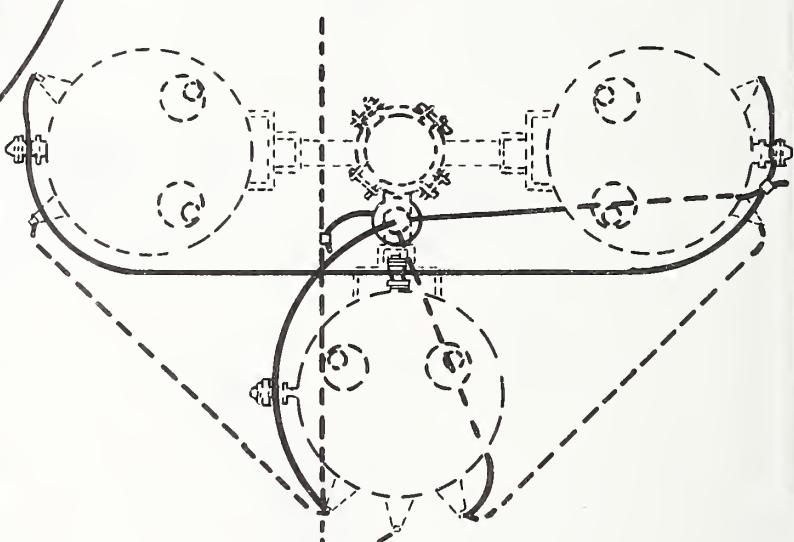


WIRING DIAGRAM

FOR INSTRUMENT TRANSFORMERS

Note:

For more detailed wiring
diagram, see REA
Bulletin 161-12

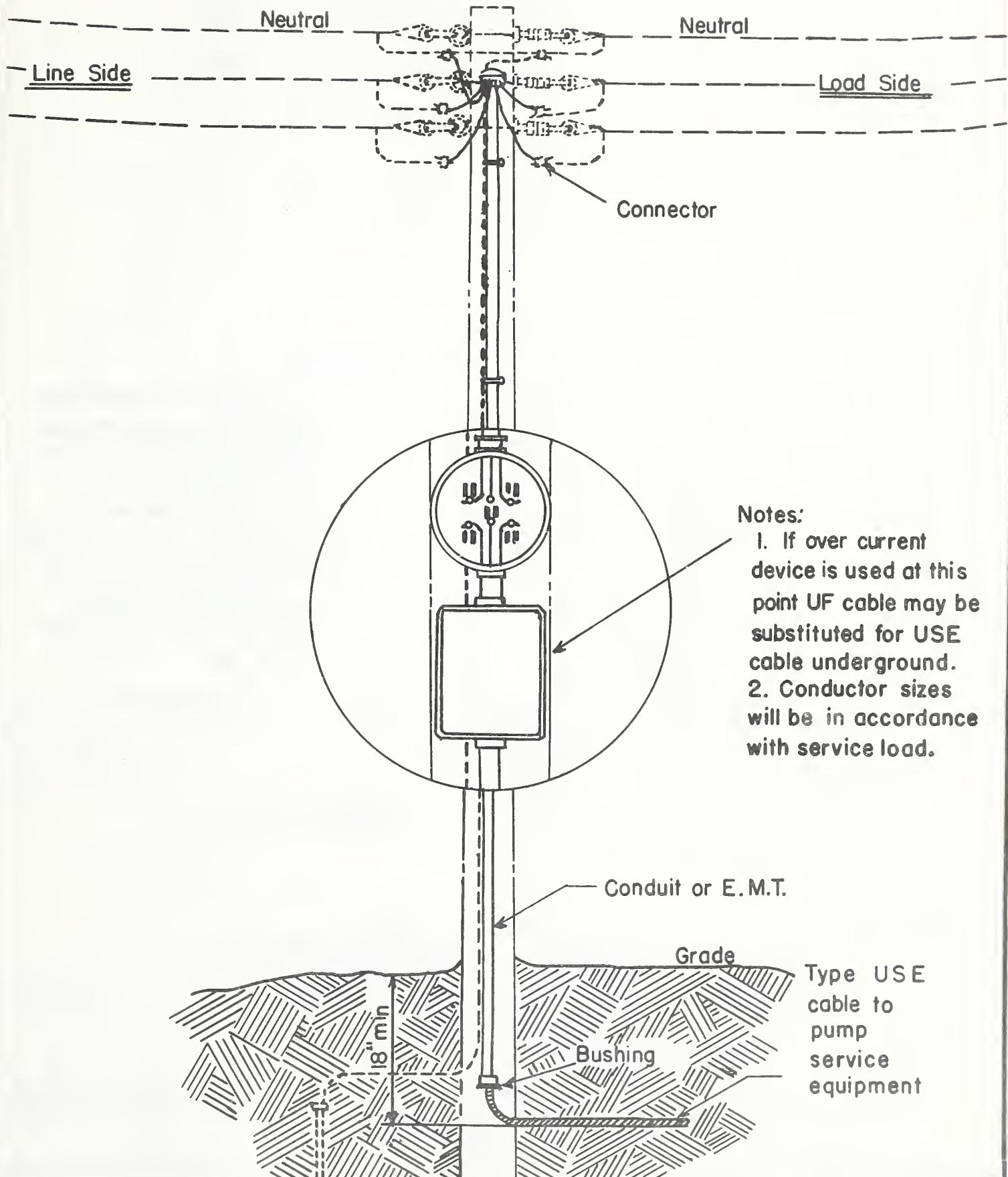


PLAN

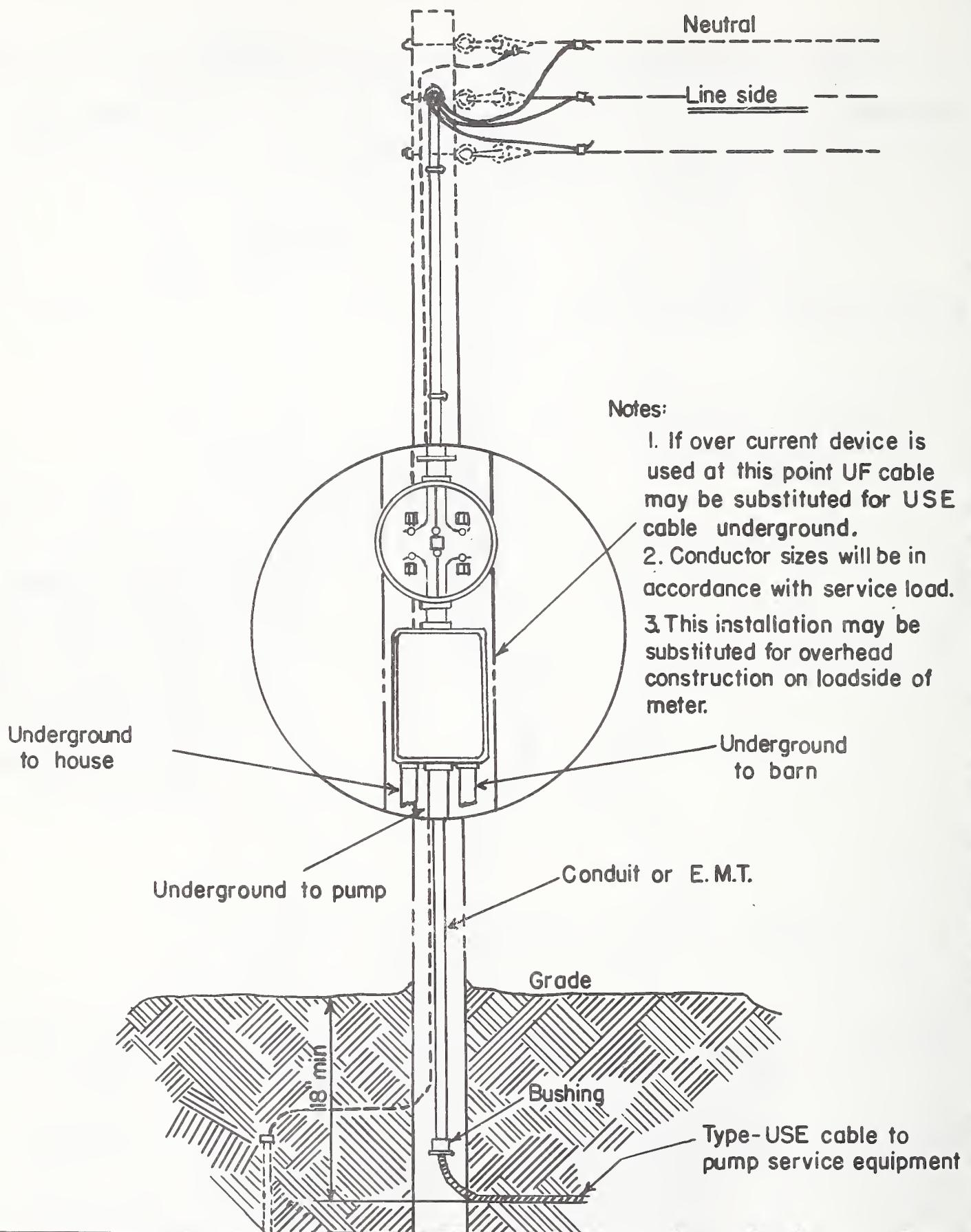
Note:
This arrangement of metering equipment is
designed for use with the transformer drawings
G310

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
j 4	Screw, lag, 1/2" x 4"	gh 1	Meter box, meter and test block
p	Connectors, as required	sd 2	Transformer, current
gc	Conduit, 1 1/4" as required	1	Service Head
ge 1	Condulet, type "LB"	sm	Wire, No. 12, insul. for current
gd	Straps, conduit, as required	sn	Wire, No. 14, insul. for potential
fo 1	Transformer secondary bracket		

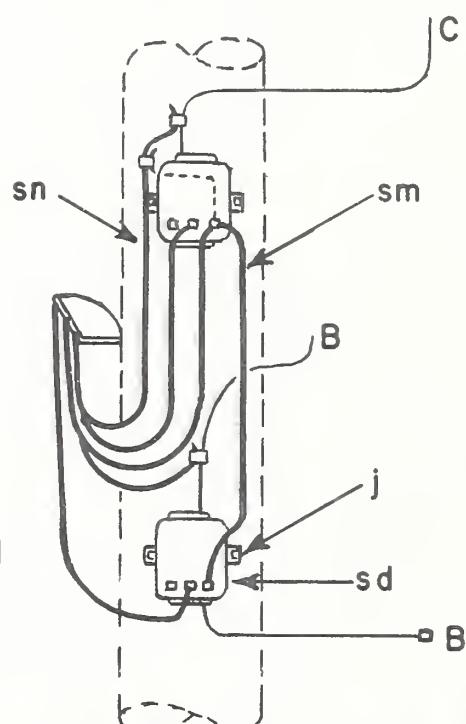
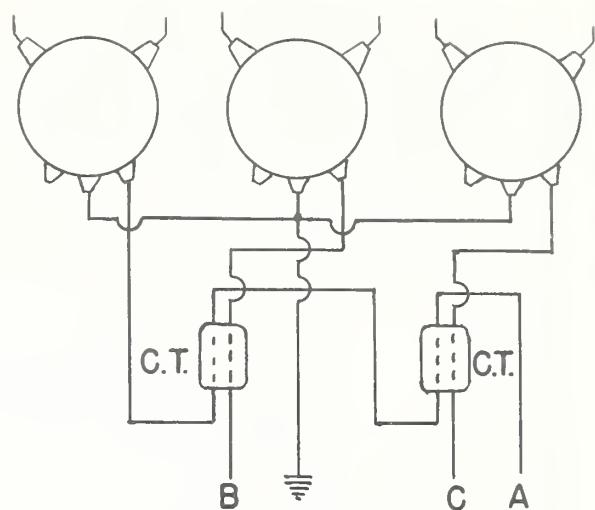
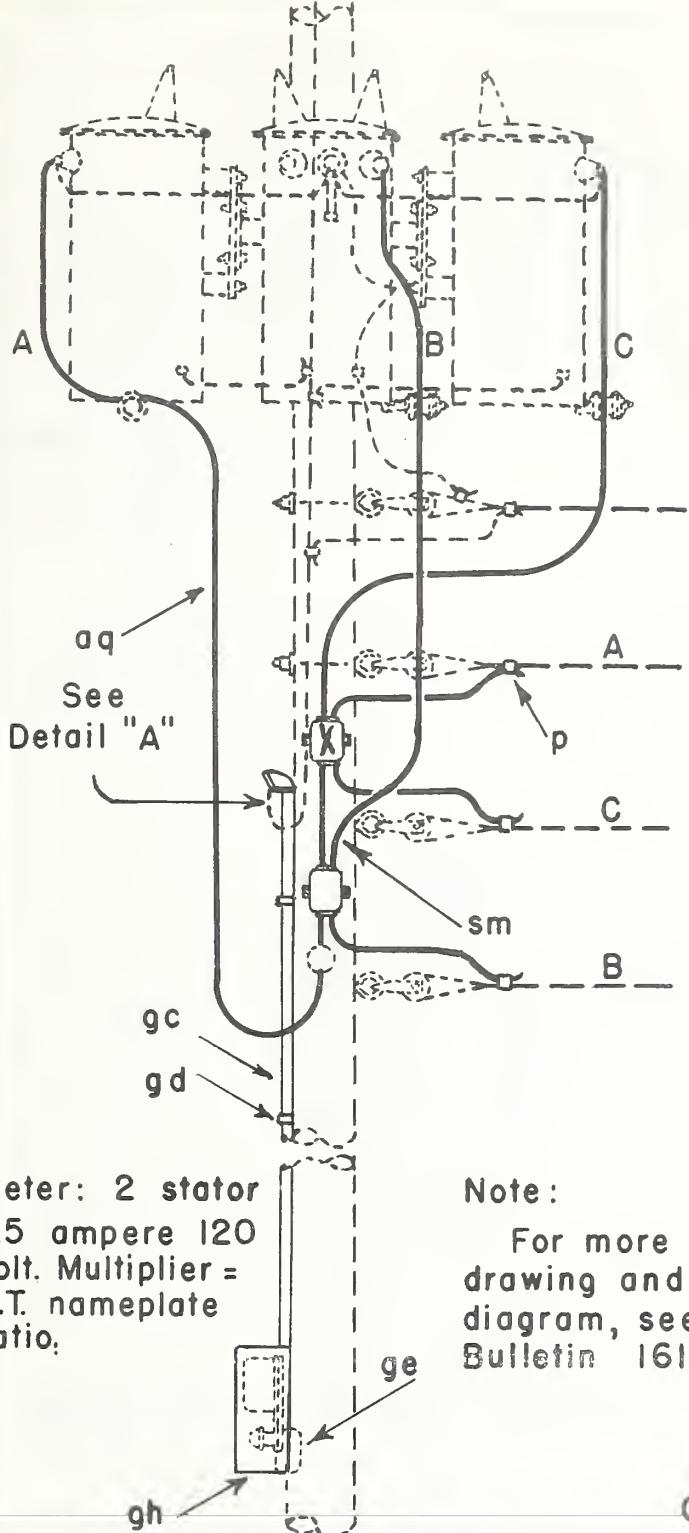
SECONDARY METERING GUIDE
THREE PHASE 120/240 VOLTS
4 WIRE DELTA



GUIDE TO YARD POLE METER INSTALLATION
(SHOWING PUMP SERVICE CARRIED
UNDERGROUND)



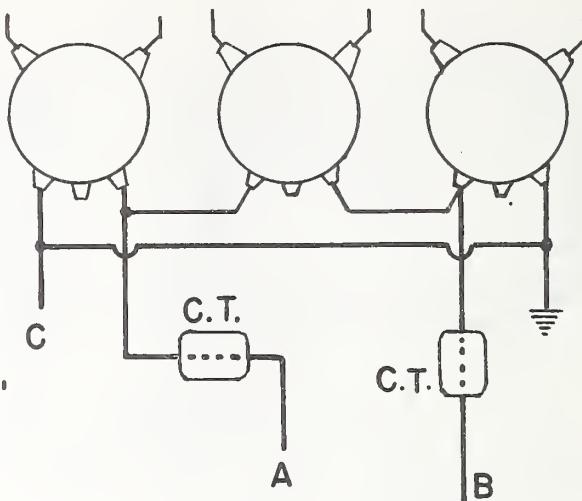
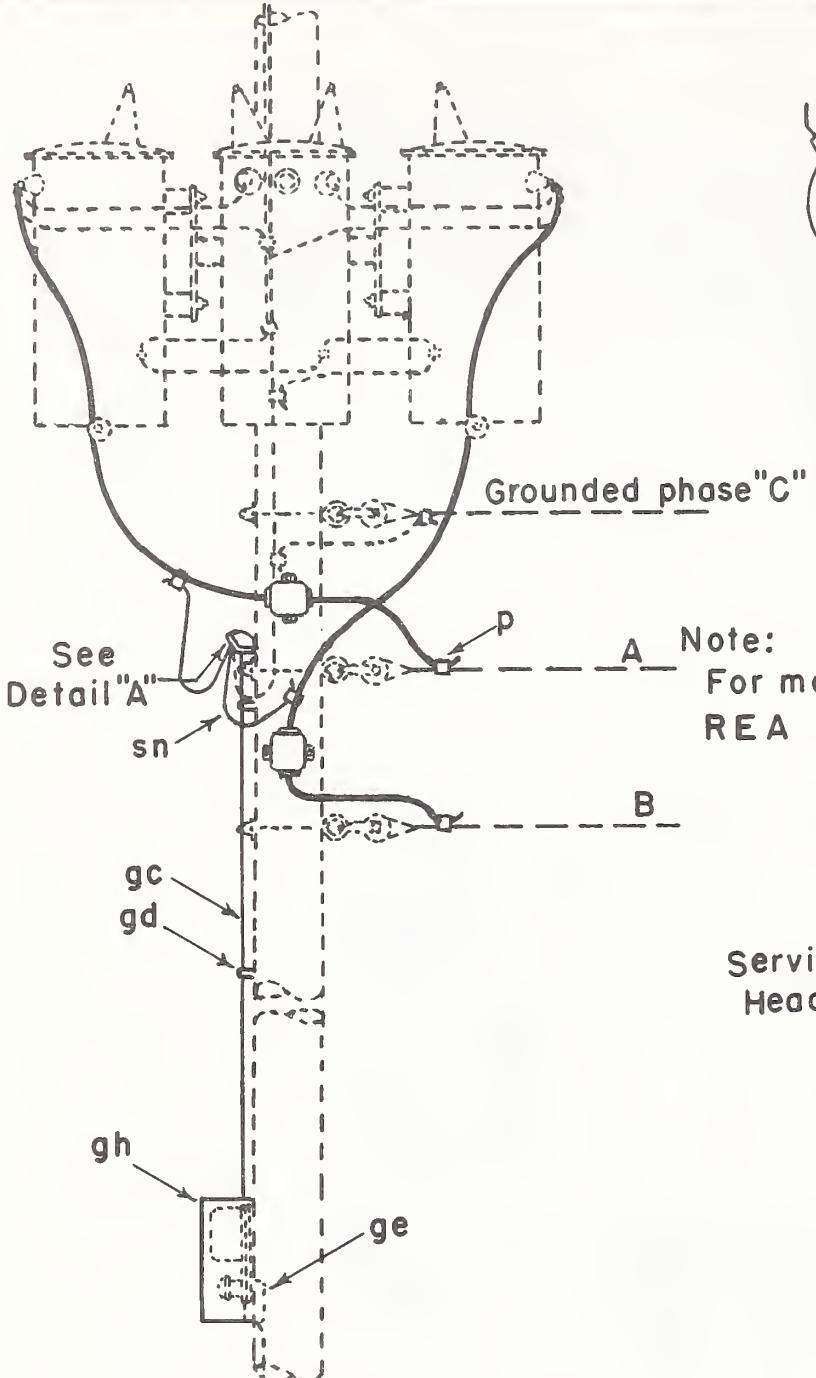
**GUIDE TO YARD POLE METER INSTALLATION
(SHOWING ALL BUILDING SERVICES CARRIED
UNDERGROUND)**



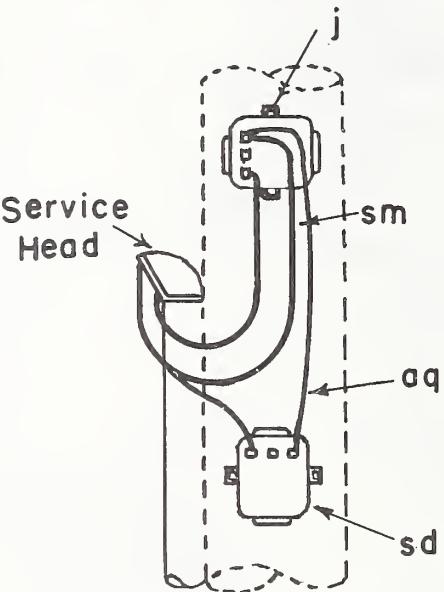
Connections from C.T.'s to Service Head

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
j	4	Screw, lag	gh	1	Meter box, meter and test block
p		Connectors, as required	sd	2	Transformer, current
jq		Jumpers, insulated	sm		Wire, No.12, insul. for current
gc		Conduit, 1 1/4", as required	sn		Wire, No.14, insul. for potential
gd		Straps, conduit, as required	I		Service Head
ge	1	Condulet, type "LB"			

SECONDARY METERING GUIDE
THREE PHASE, 120/208 VOLTS
4 WIRE GROUNDED WYE



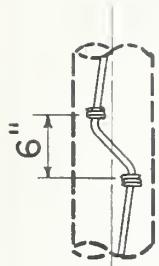
WIRING DIAGRAM
For more detailed wiring diagram, see
REA Bulletin 161-12



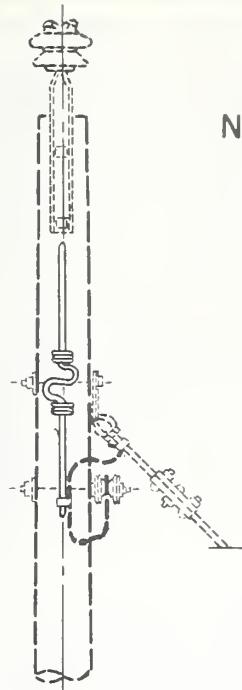
DETAIL "A"
Connections from CT's. to Service Head

ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
j 4	Screw, lag, 1/2" x 4"	sd 2	Transformer, current
p	Connectors, as required	sm	Wire, No. 12, insul. for current
i	Service head	sn	Wire, No. 14, insul. for potential
gc	Conduit, 1 1/4", as required	aq	Jumper
gd	Straps, conduit, as required		
ge	Condulet, type "LB"		
gh	Meter box, meter and test block		

SECONDARY METERING GUIDE
THREE PHASE 240 VOLTS
3 WIRE CORNER GROUNDED DELTA

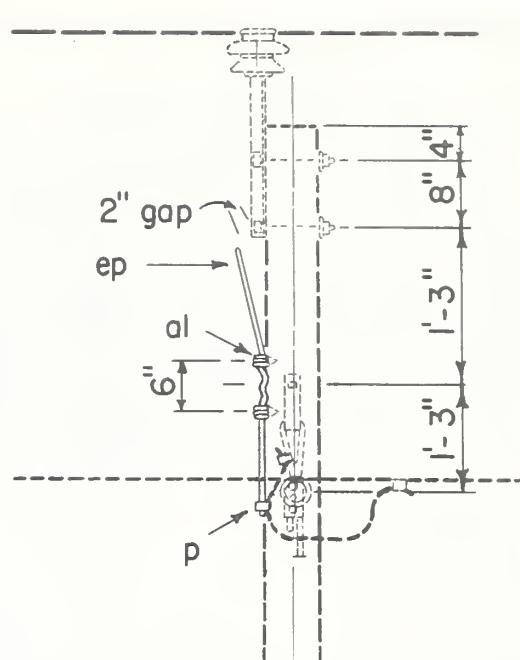


Arcing horn bend when hand formed.



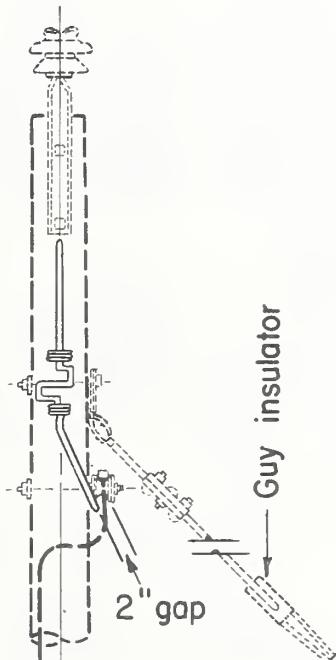
Note:
Bend arcing horns to
provide 2" gaps.

ELEVATION



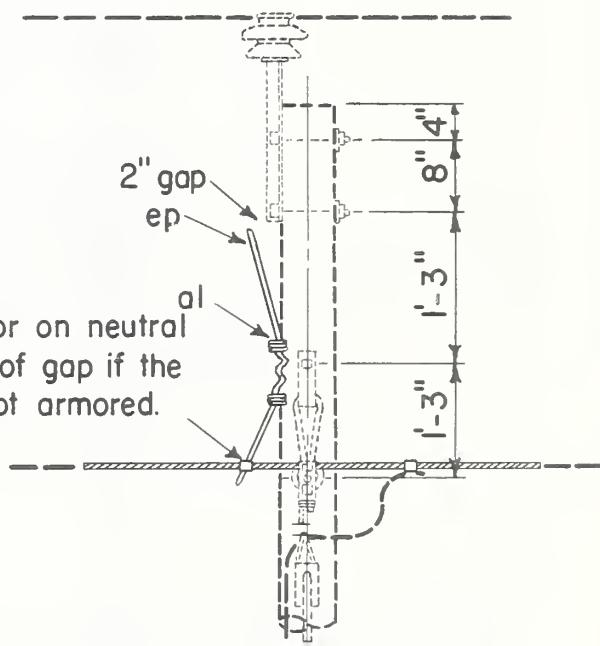
SIDE ELEVATION

ARCING HORN ARRANGEMENT FOR GROUNDED GUY



ELEVATION

Install connector on neutral
to form point of gap if the
conductor is not armored.

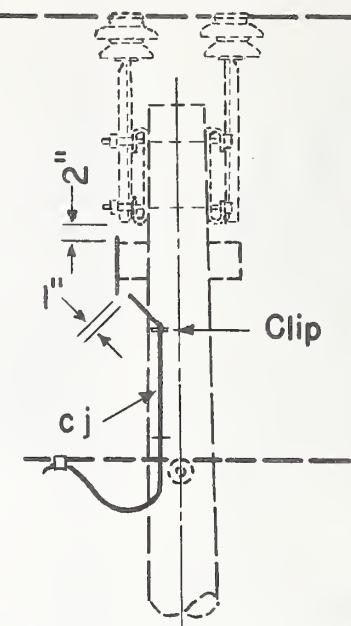
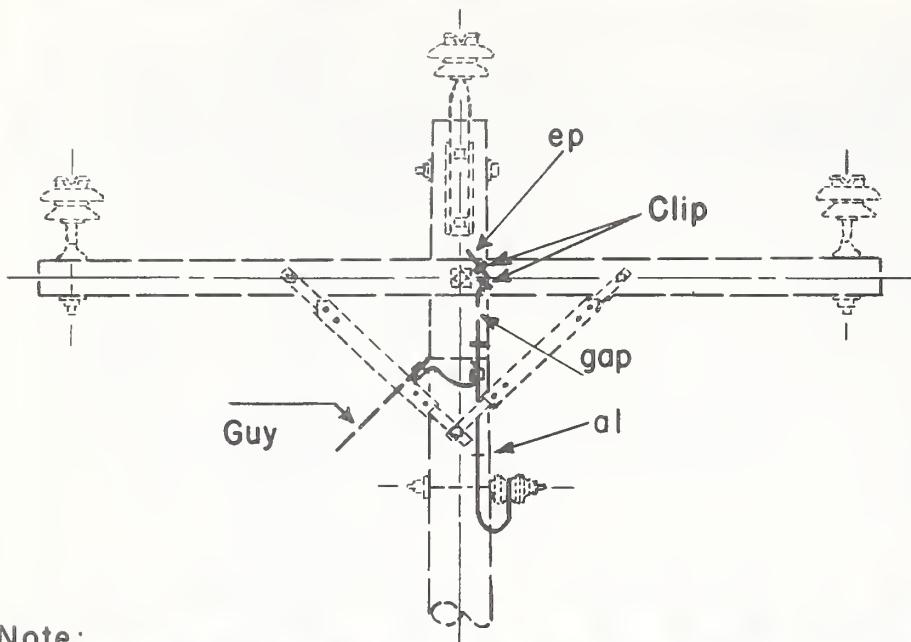


SIDE ELEVATION

ARCING HORN ARRANGEMENT FOR INSULATED GUY OR UNGUYED POLE

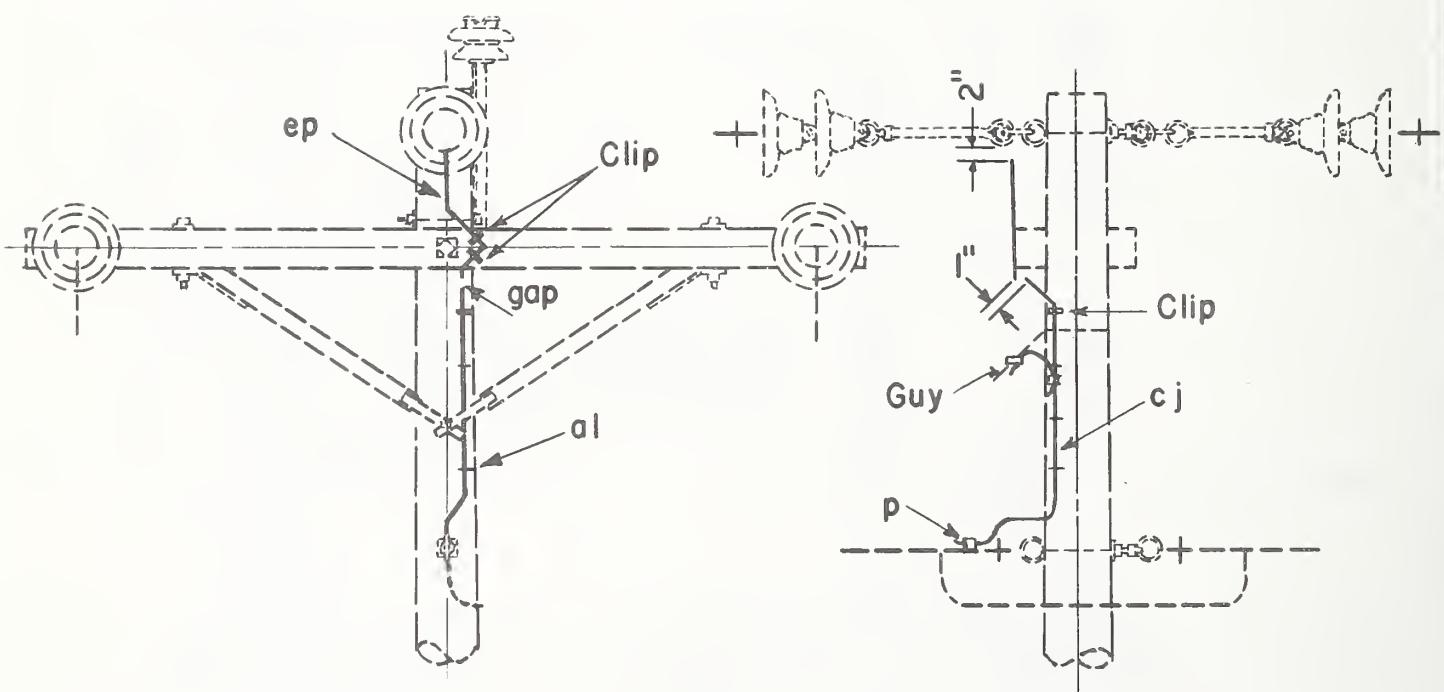
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as req'd.	ep	1	Arcing horn #4 or #2 HD copper, as req'd.
al	2	Ground wire clip			

14.4/24.9 KV, 1-PHASE
VERTICAL CONSTRUCTION - 0° TO 30° ANGLE
ARCING HORN ASSEMBLIES



Note:

Use similar design for single primary support, bending upper horn gap as necessary to form 2" gap to pole top pin through bolt.



ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
p	Connectors, as required	cj	Ground wire, #6 S.D. Copper or equiv.
al 3	Ground wire clip	ep	Arcing horn, #4 H.D. Copper, as req'd.
al	Staples, ground wire, 3/16" x 1 1/2" x #9, as req'd.		

14.4 / 24.9 KV - THREE PHASE
ARCING HORN ASSEMBLY GUIDE

TOLERANCES
SIZES OF HOLES

Nominal	G0	No Go
(A) $\frac{1}{16}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "
(B) $\frac{7}{16}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "
(C) $\frac{11}{16}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "
(D) $\frac{9}{16}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "

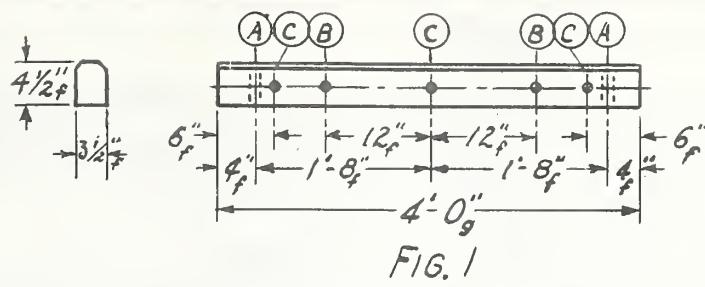


FIG. 1

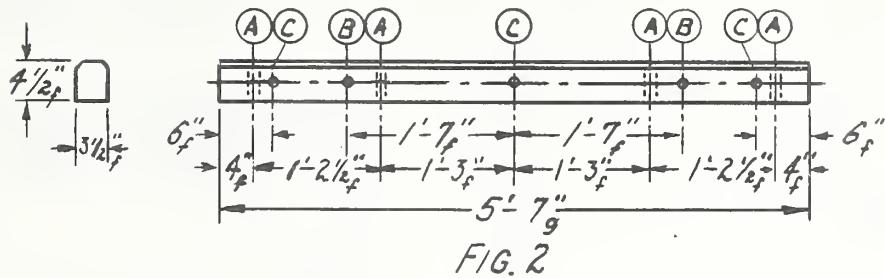
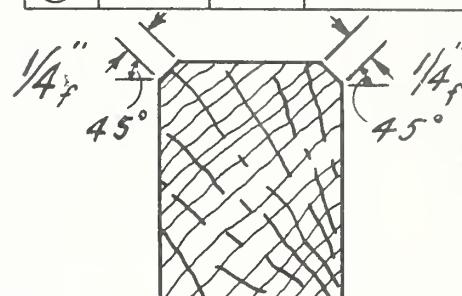


FIG. 2



TYPICAL
ENLARGED
SECTION

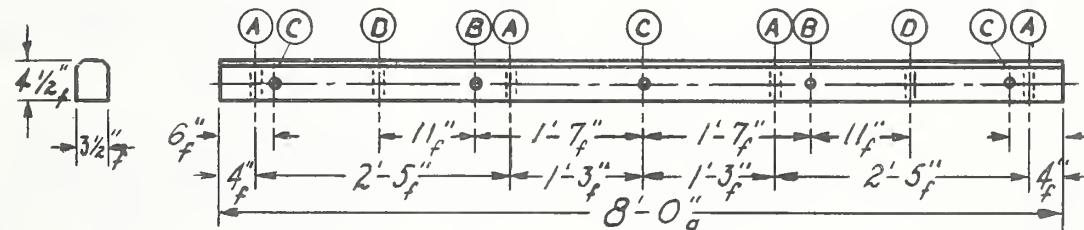


FIG. 3

f ----- $\frac{1}{8}$ "
g ----- $\frac{1}{4}$ "

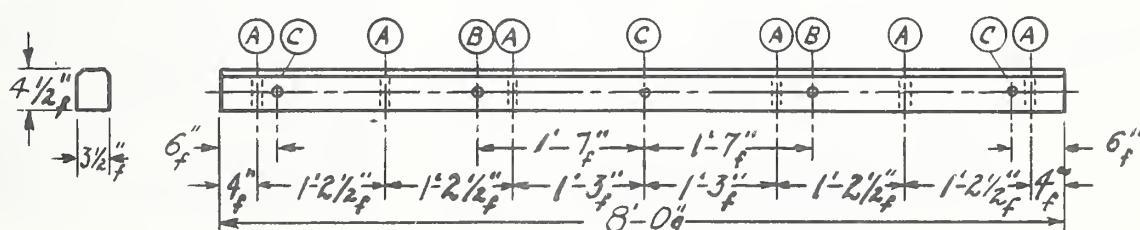


FIG. 4

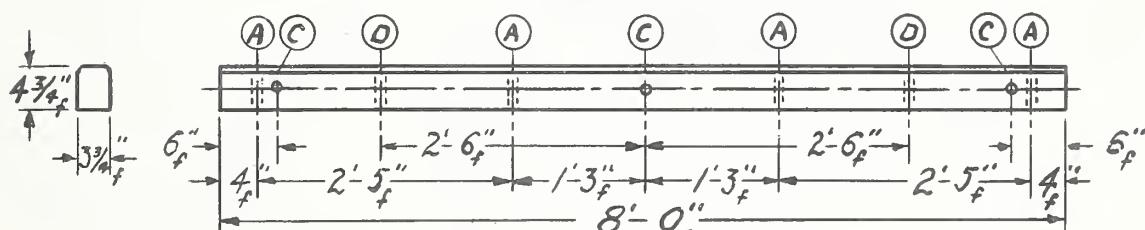


FIG. 5

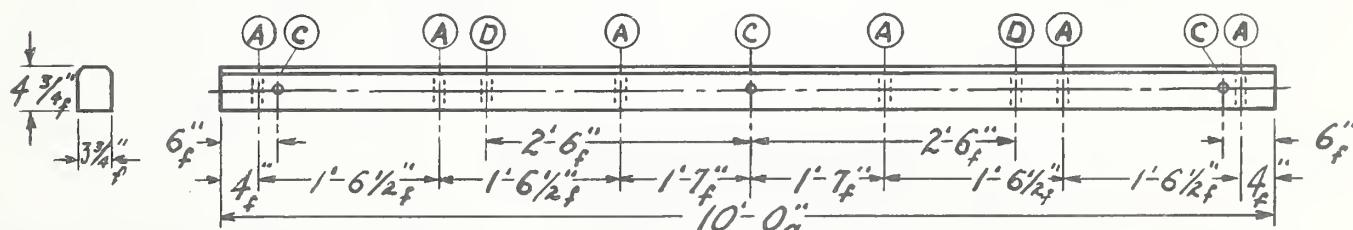


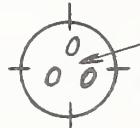
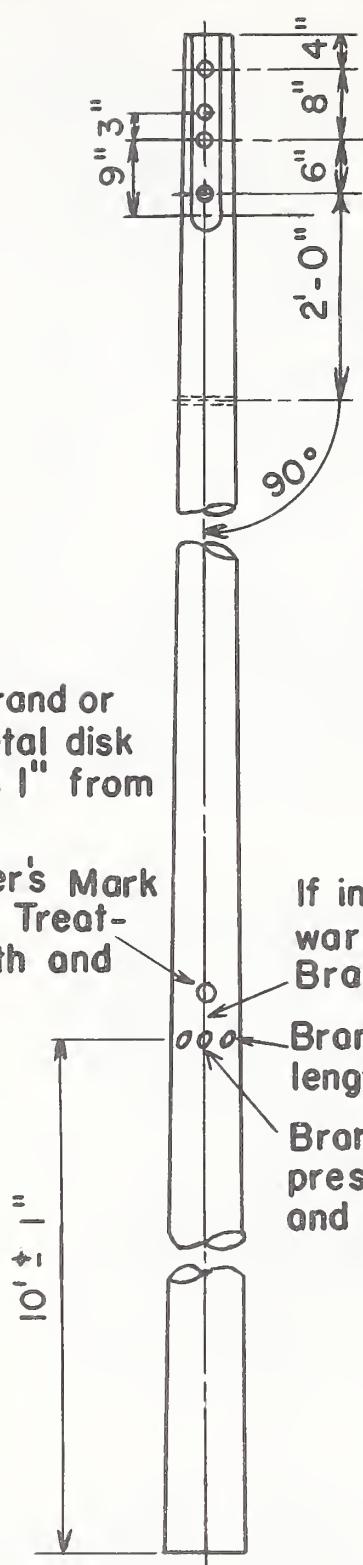
FIG. 6

Note:
Eight foot crossarms may be drilled for 42" span angle braces,
if so specified.

CROSSARM DRILLING GUIDE

Bottom of brand or center of metal disk shall be $10' \pm 1"$ from the butt.

Manufacturer's Mark and Date of Treatment. (Month and Year)



Brand butt with proper length and class.



Holes -
Drill 11/16" diameter

Neutral bolt hole must be at 90° angle with thru bolt holes.

Gains -

Gains are to be flat with plane at right angles to bolt hole.

All poles treated full-length must be bored, roofed, and gained before treatment, except that Class 7 and smaller poles need not be gained unless requested by purchaser. Roofs may be flat or at a 15° angle at the producer's option.

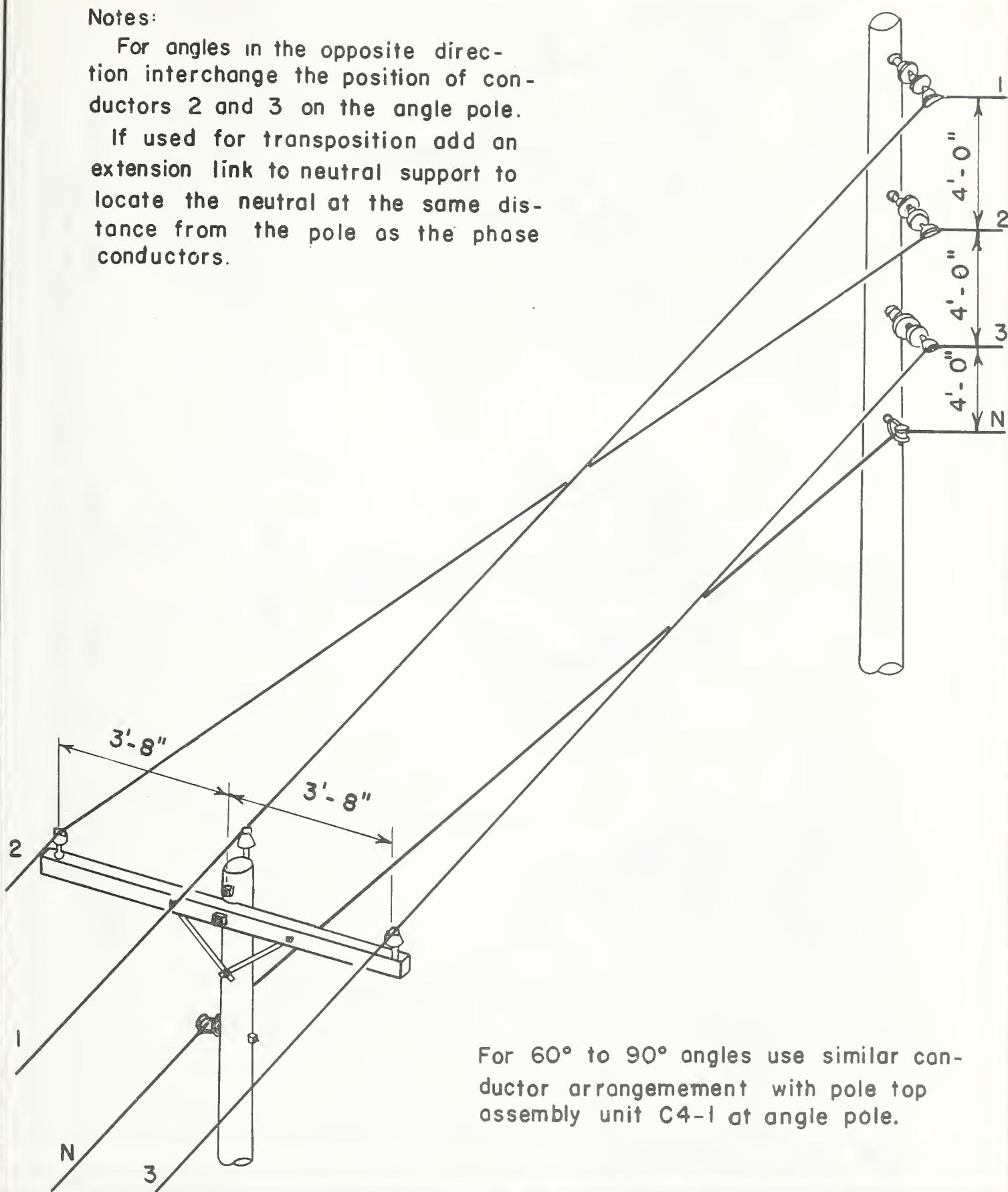
Note: $14' \pm 1"$ mark for poles 55' and longer

POLE FRAMING GUIDE

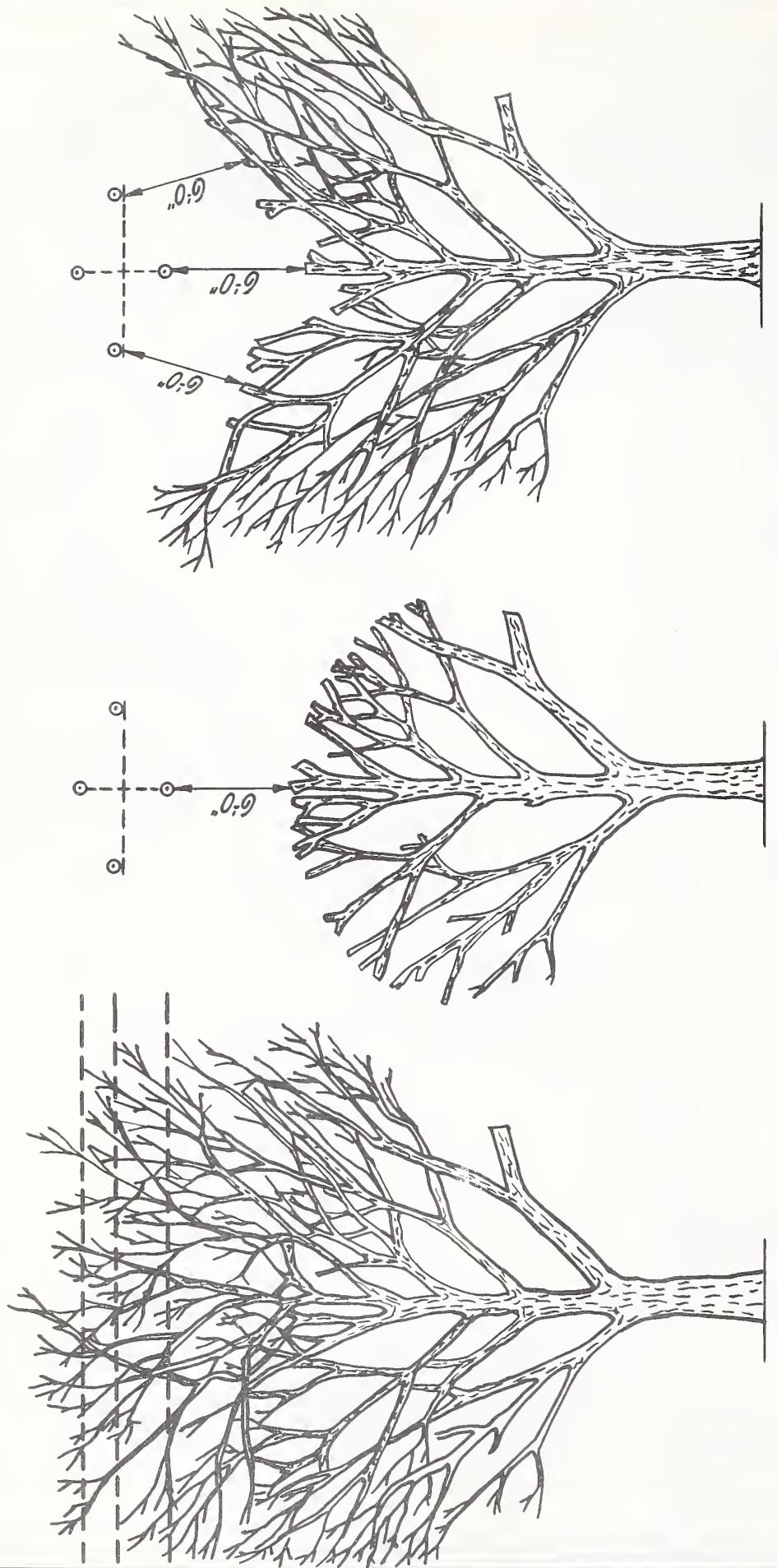
Notes:

For angles in the opposite direction interchange the position of conductors 2 and 3 on the angle pole.

If used for transposition add an extension link to neutral support to locate the neutral at the same distance from the pole as the phase conductors.



ANGLE CONSTRUCTION GUIDE
CROSSARM TO VERTICAL CONST. - 30° TO 60° ANGLE



Before Trimming

Right Way

Wrong Way

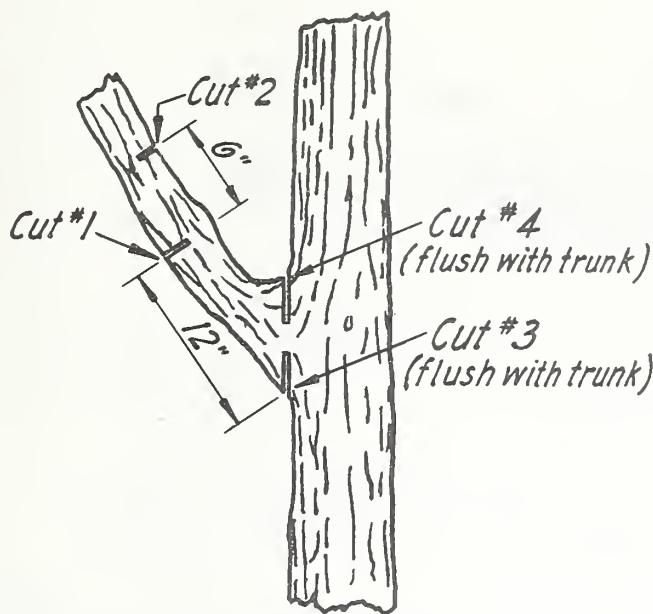
Note:

No parts of tree should be closer than 6'-0" from open wiring.
Trimming should leave tree with symmetrical appearance.

TREE TRIMMING GUIDE

Jan 1, 1962

M22-1



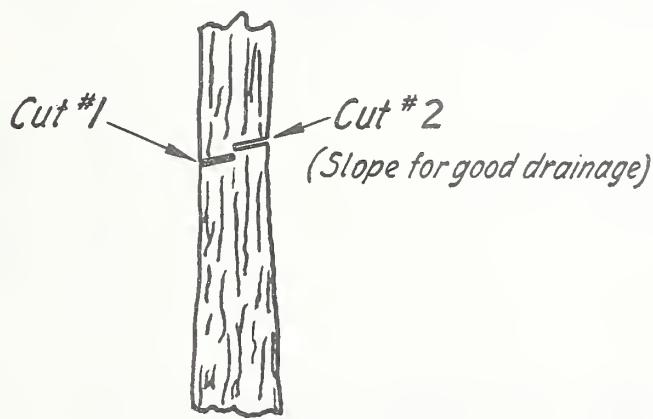
Right Way



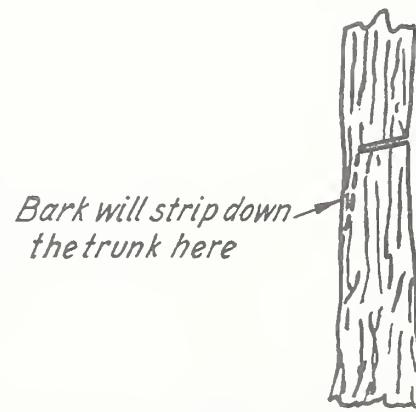
Wrong Way

For small branches
omit Cuts #1 and #2

REMOVAL OF HEAVY SIDE LIMB



Right Way

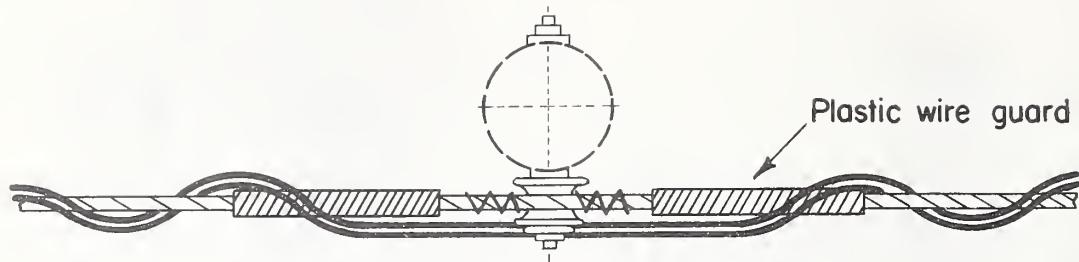


Wrong Way

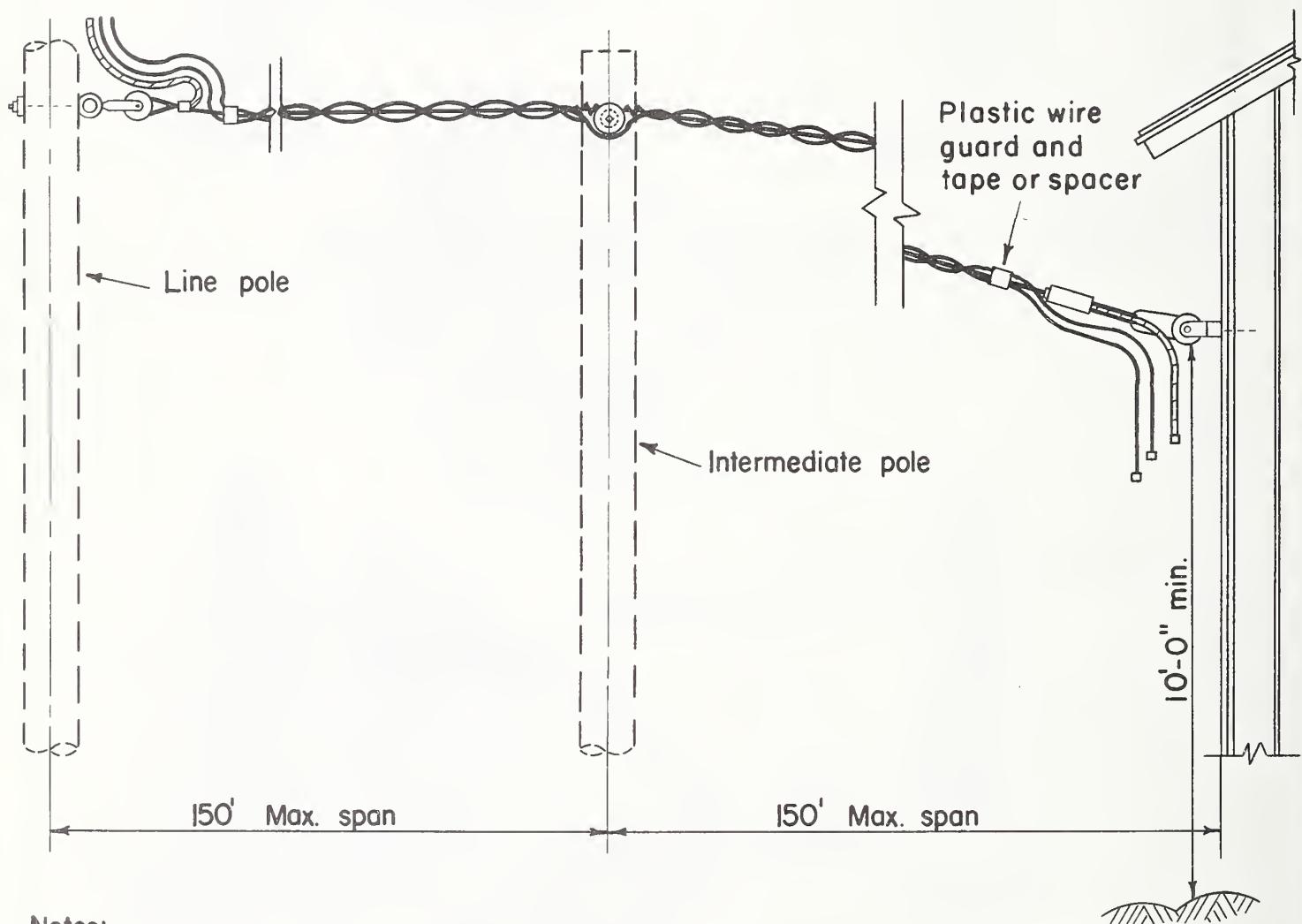
REMOVAL OF VERTICAL LIMB

NOTE: Coat final cut with tree paint.

TREE TRIMMING GUIDE



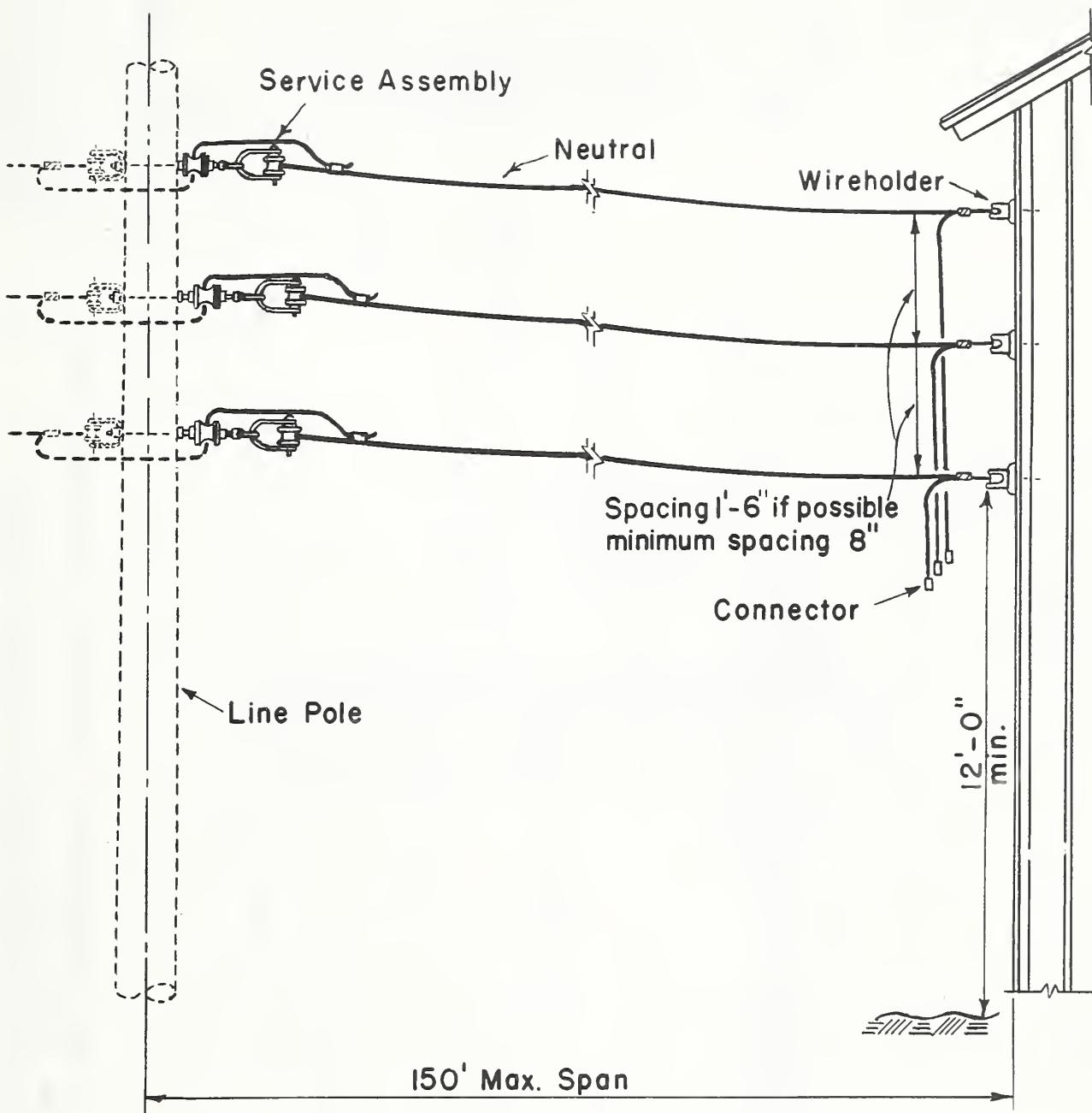
PLAN



Notes:

1. Services as short as possible are preferred.
2. Refer to secondary and service assemblies for construction details.

CABLE SERVICE ASSEMBLY GUIDE

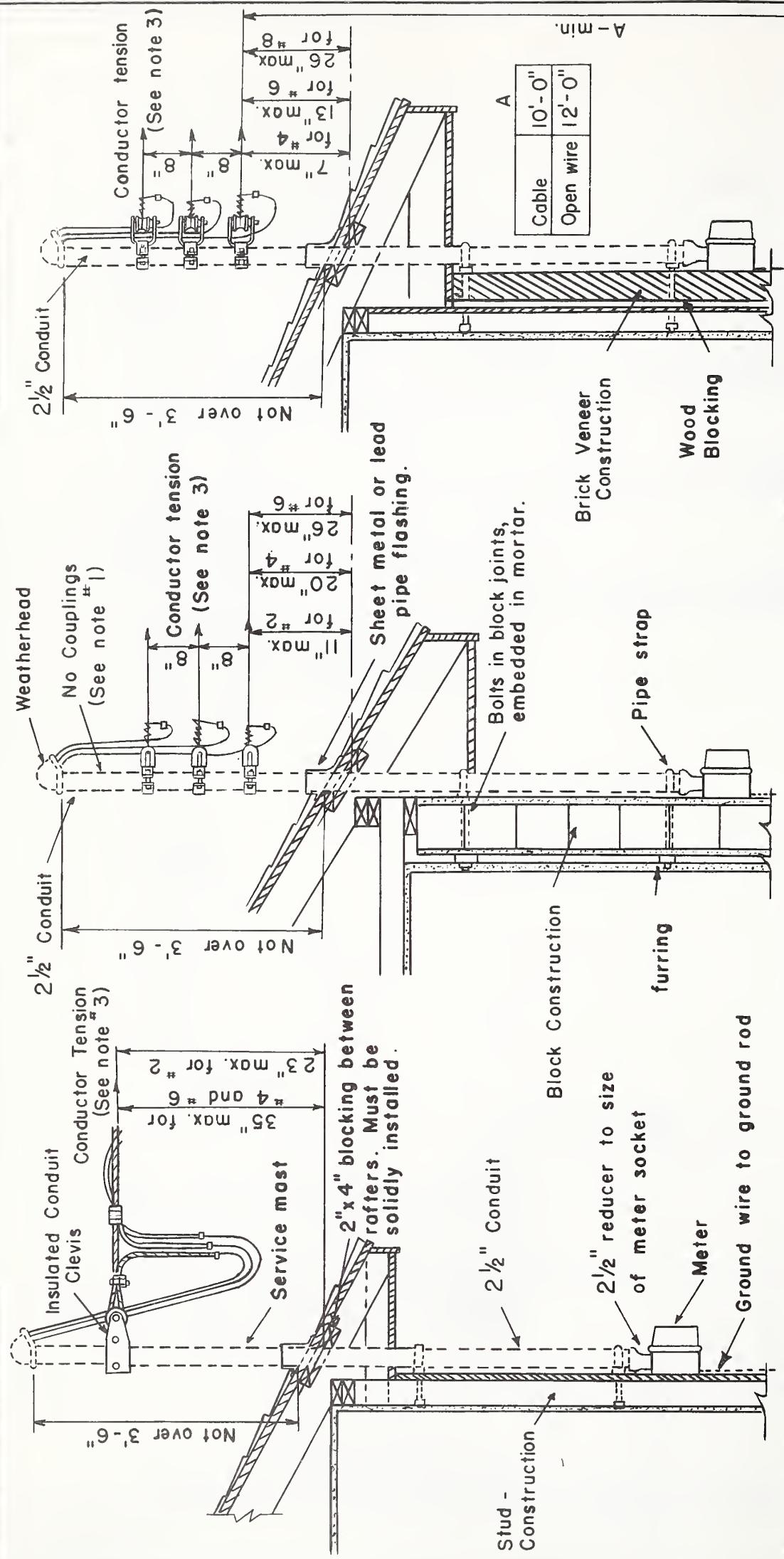


Notes:

Insulation on covered conductor that is under strain should not be cut.

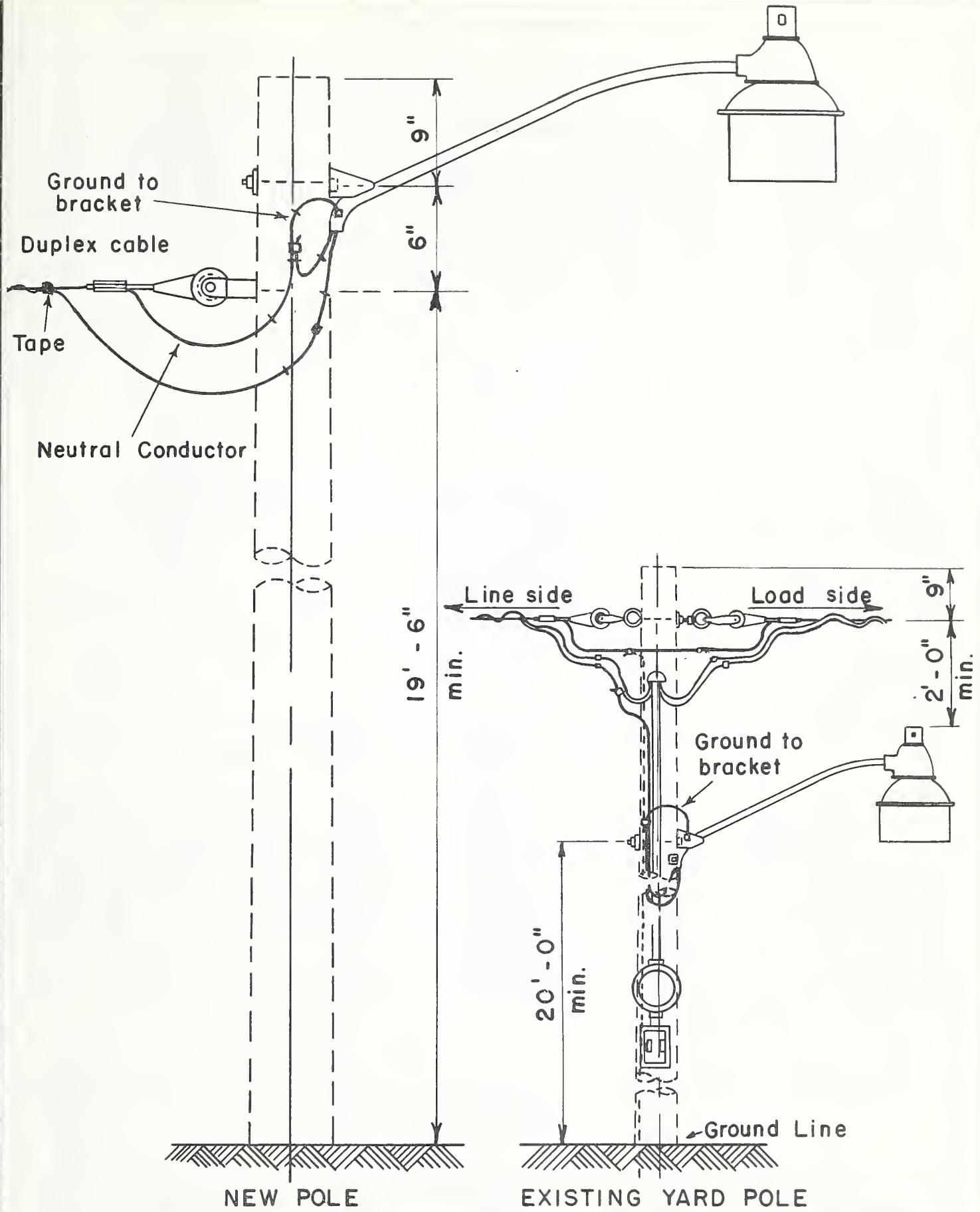
In brick or concrete walls use 3/8" expansion bolts or shields in 5/8" holes at least 2 1/2" deep, or wedge expanded eyebolts.

	OPEN WIRE SERVICE ASSEMBLY GUIDE	
Jan 1, 1962		M24-1



ASSEMBLY GUIDE OF SERVICE MAST
FOR RANCH TYPE HOUSE

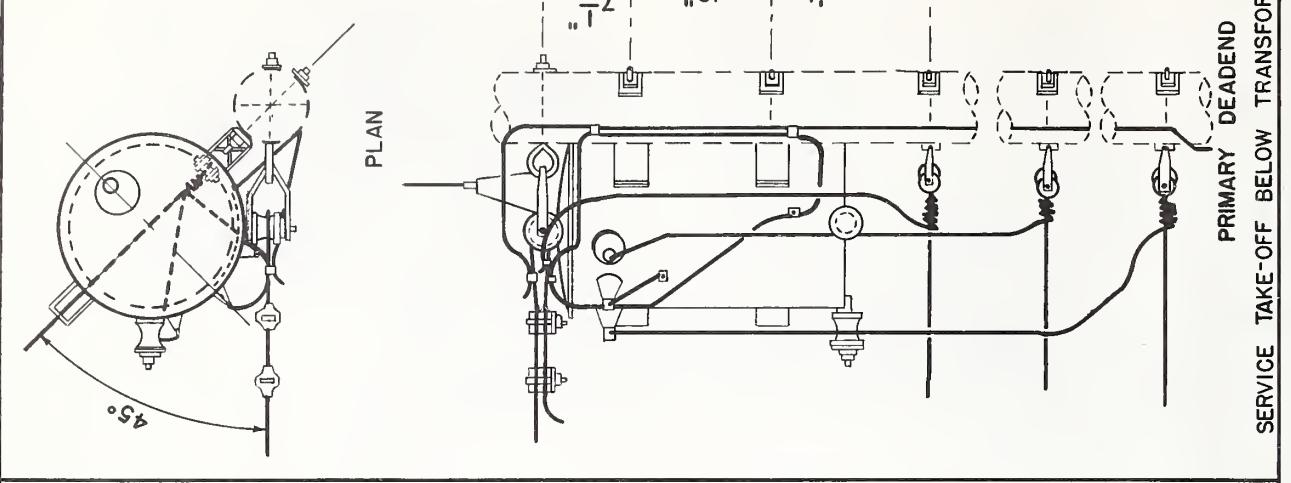
Jan 1, 1962 M24-10



SECURITY LIGHT INSTALLATION GUIDE
(UNMETERED)

Jan 1, 1962

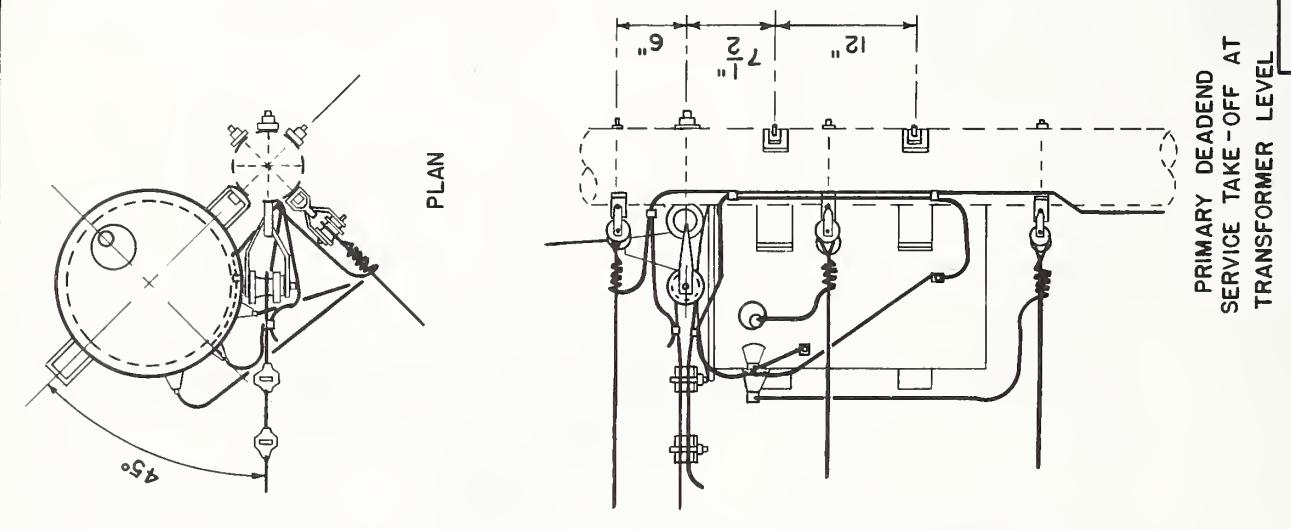
M26-5



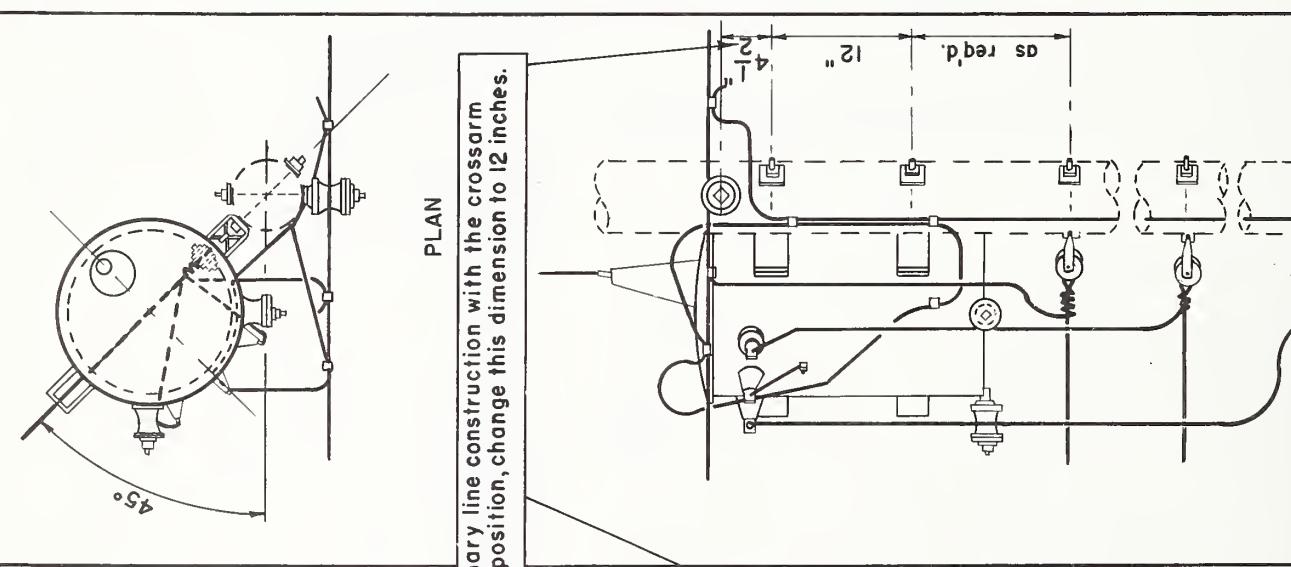
TRANSFORMER CONNECTION GUIDE OPEN WIRE SERVICES

TRANS
Jan 1, 1962

100



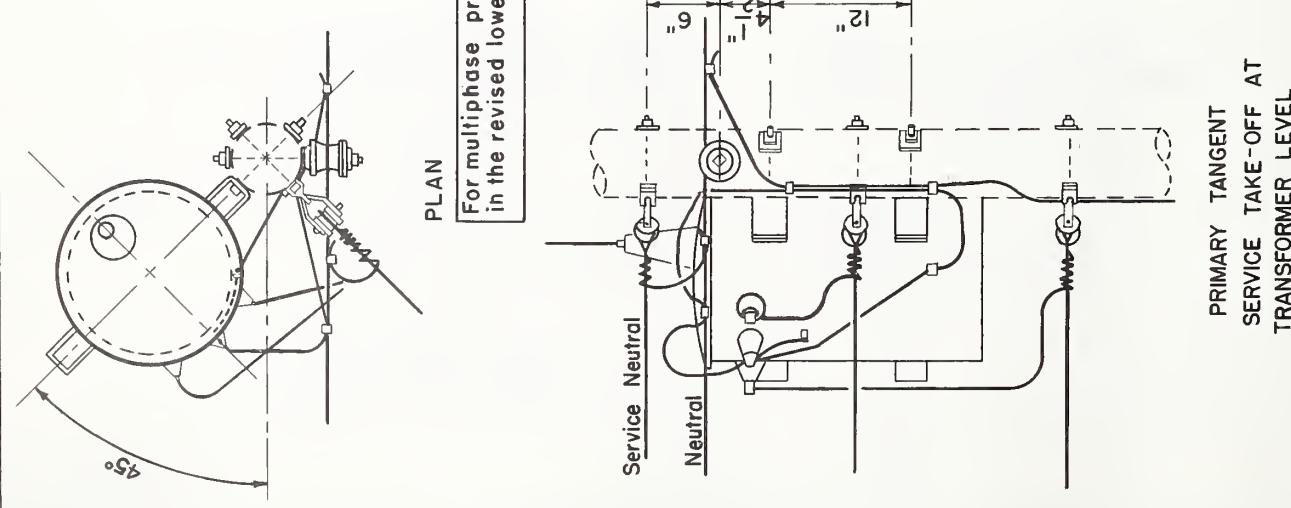
**PRIMARY DEADEND
SERVICE TAKE-OFF AT
TRANSFORMER LEVEL**

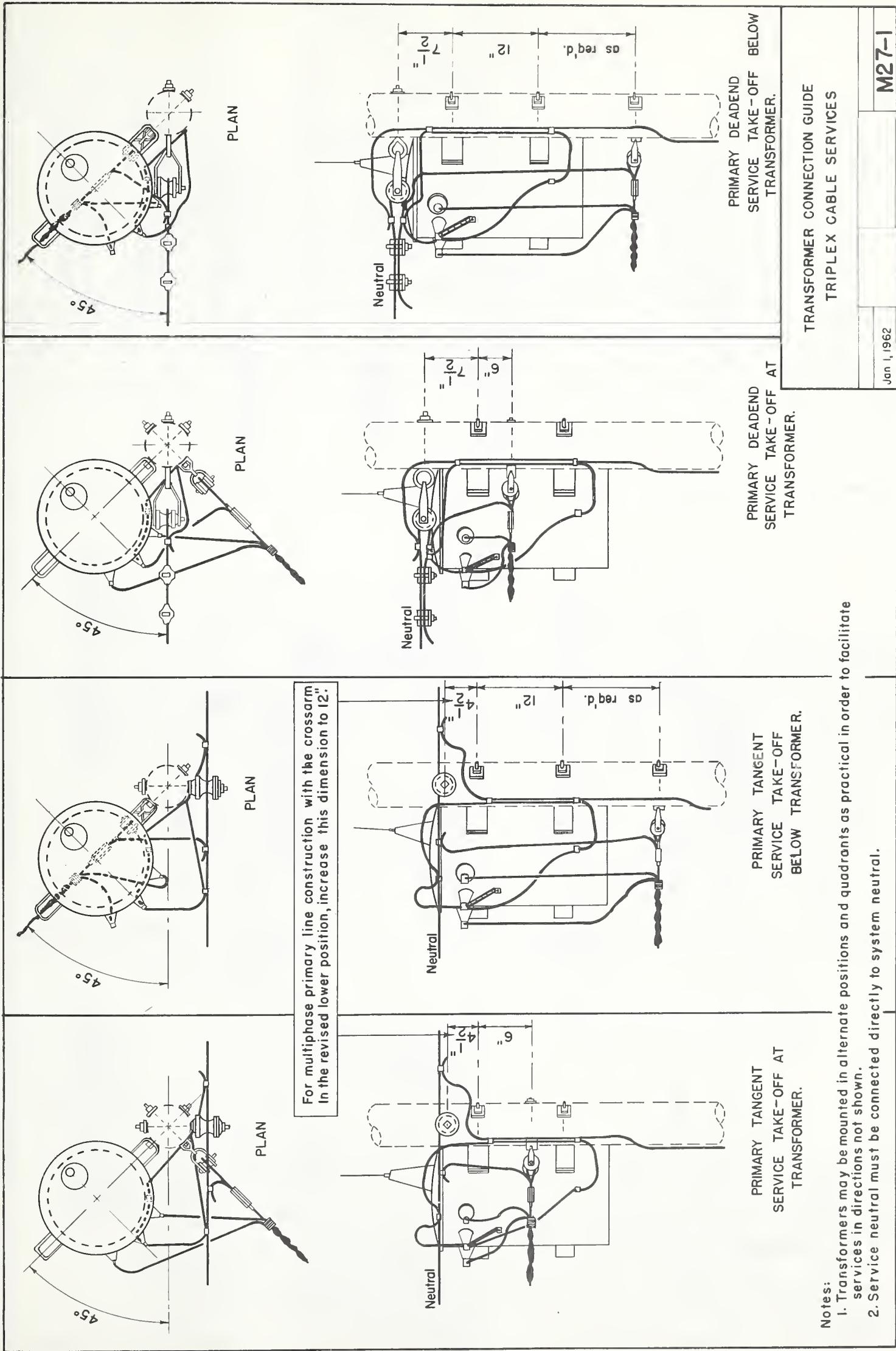


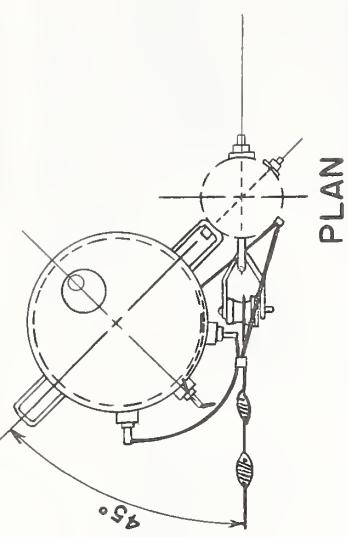
For multiphase primary line construction with the crossarm in the revised lower position, change this dimension to 12 inches.

PRIMARY TANGENT
SERVICE TAKE-OFF A
TRANSFORMER LEVEL

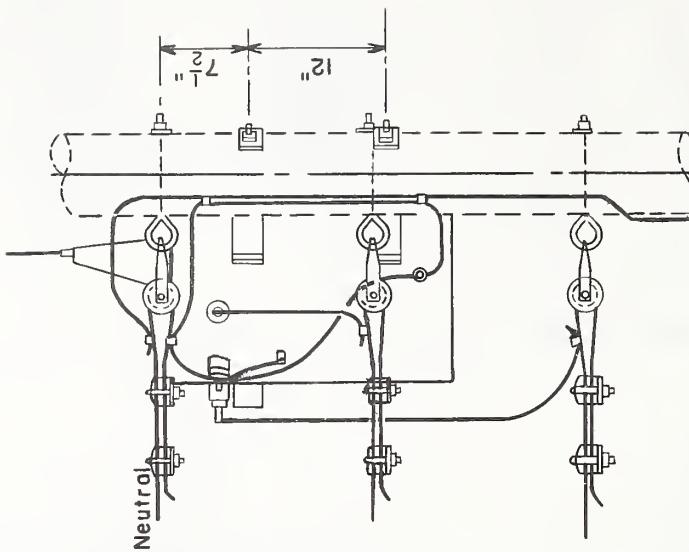
Transformers may be mounted in alternate positions and quadrants as practical in order to facilitate services in directions not shown.







PLAN

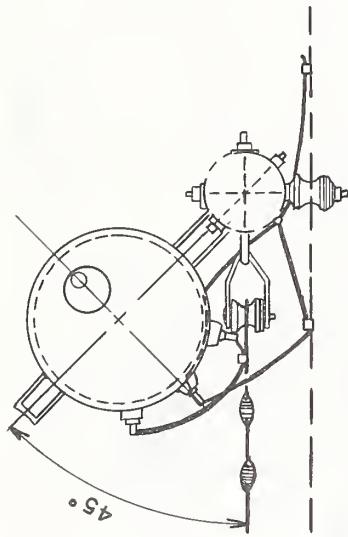


**PRIMARY DEADEND
SECONDARY DEADEND**

TRANSFORMER CONNECTION GUIDE
SECONDARY UNDERBUILD

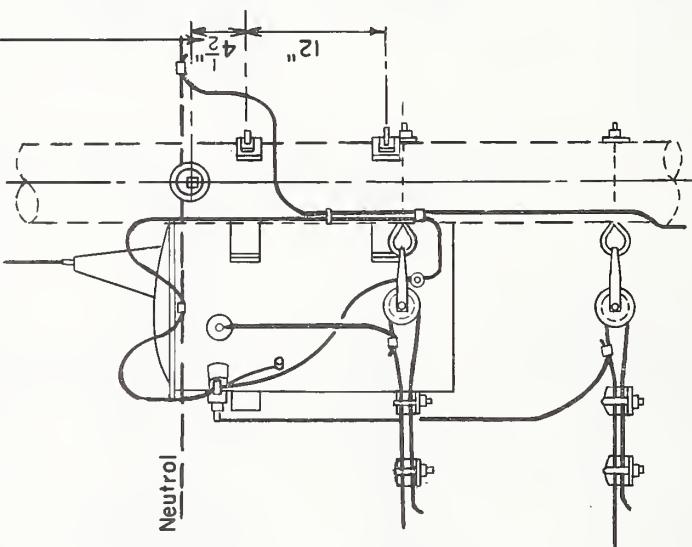
Jan 1, 1962

M27-2

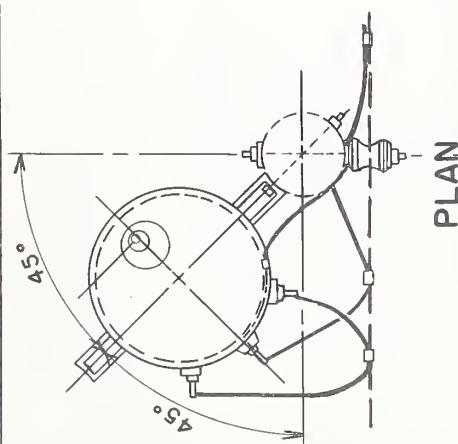


PLAN

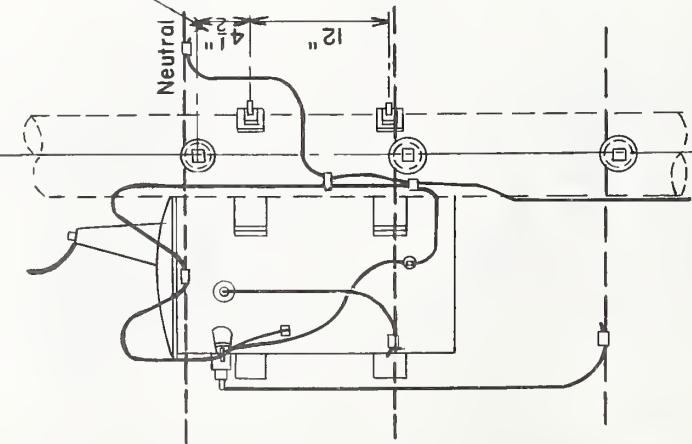
For multiphase primary line construction with the crossarm in the revised lower position, increase this dimension to 12 inches.



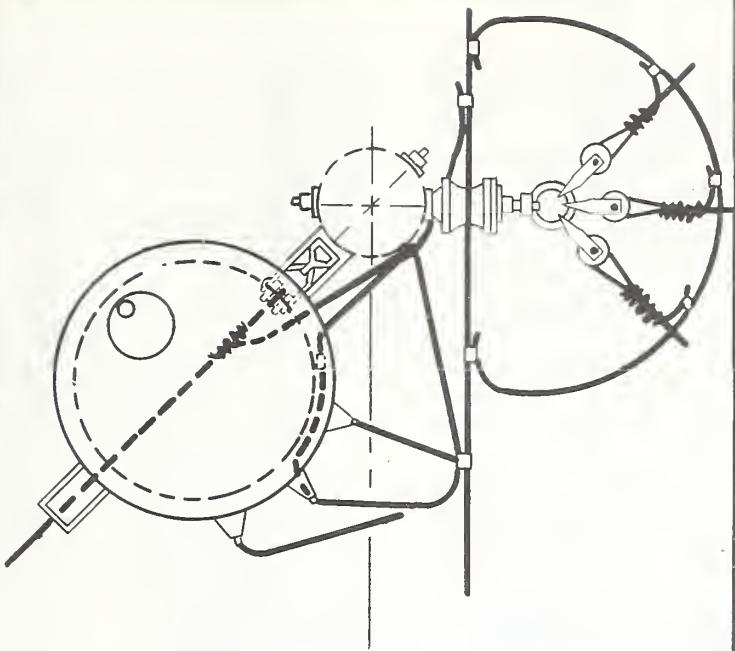
**PRIMARY TANGENT
SECONDARY DEADEND**



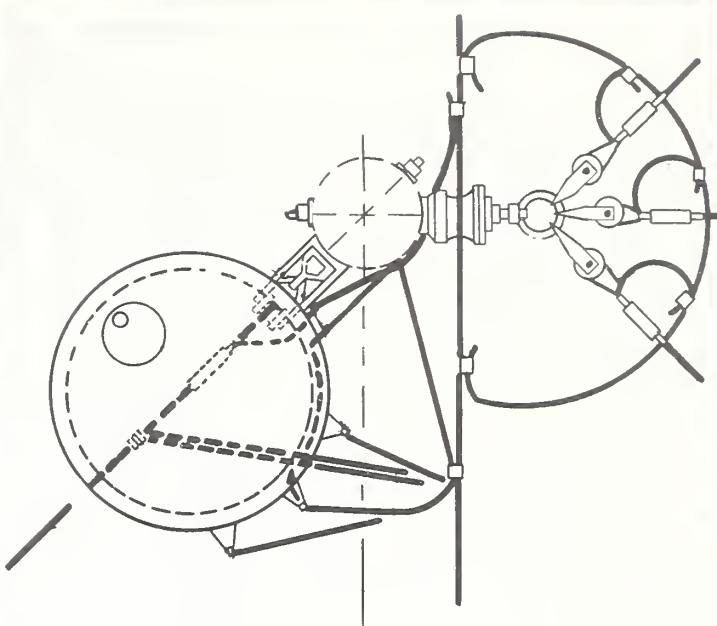
PLAN



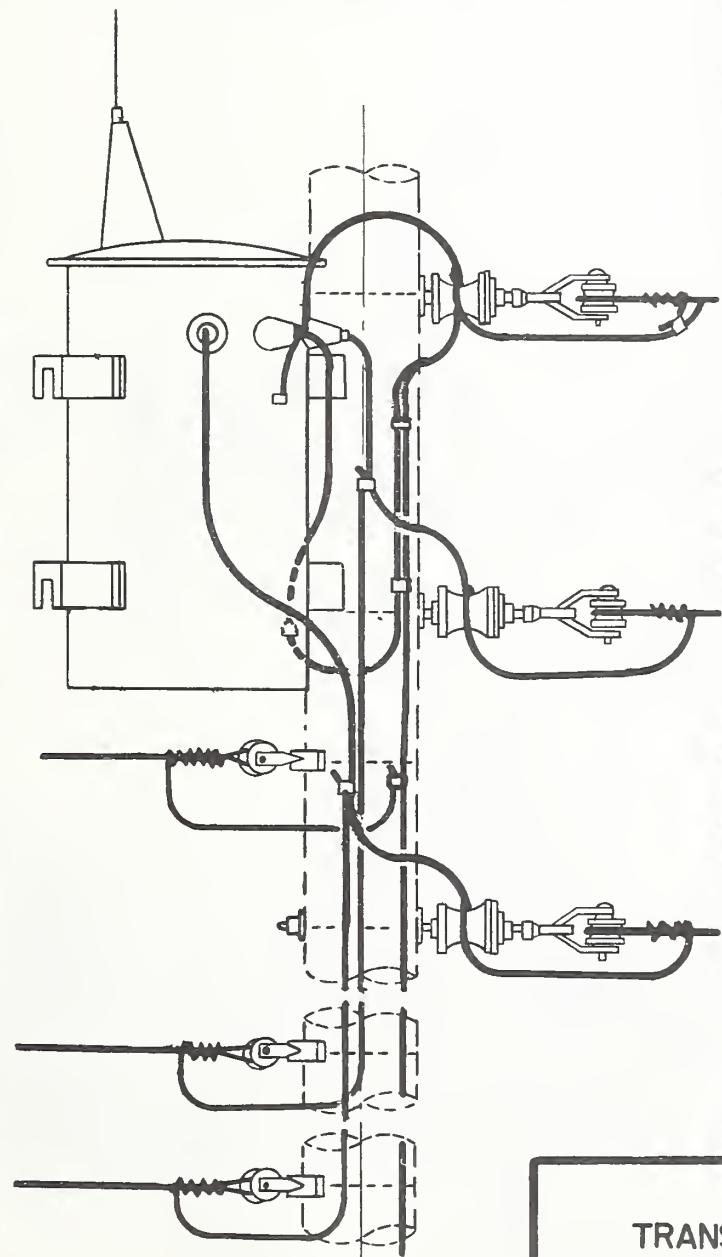
**PRIMARY TANGENT
SECONDARY TANGENT**



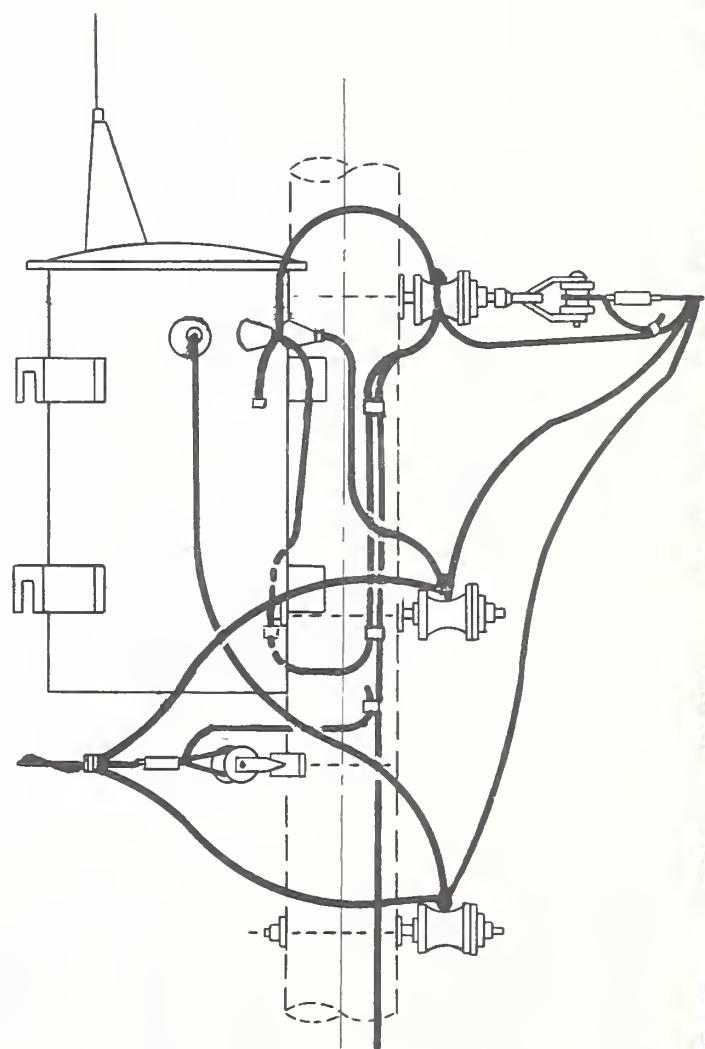
PLAN



PLAN

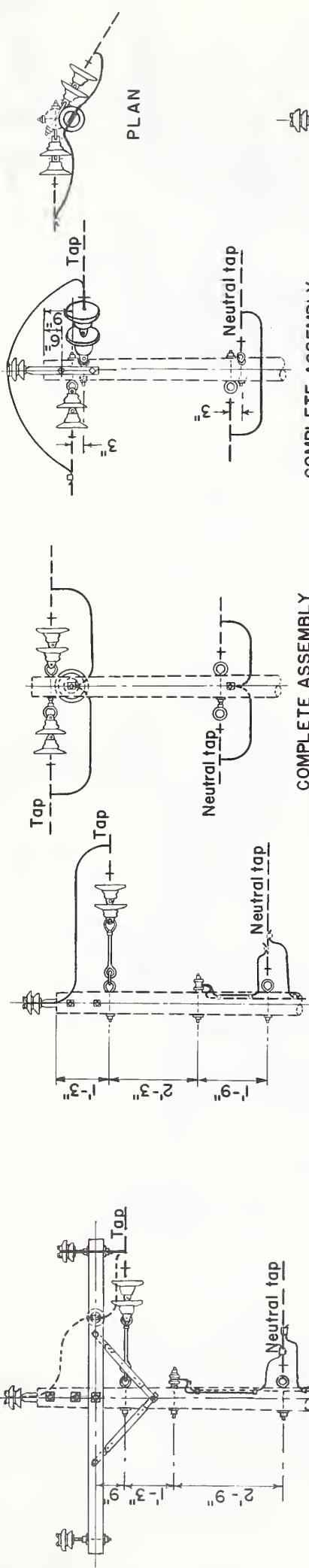


OPEN WIRE



TRIPLEX CABLE

TRANSFORMER CONNECTION AND SERVICE
TAKE-OFF GUIDE FROM SECONDARY



COMPLETE ASSEMBLY
VCI, VA5-2 and VM5-7 (if needed)

**COMPLETE ASSEMBLY
VA5-2 AND VAI**

COMPLETE ASSEMBLY
VA5-3 AND VA4

COMPLETE ASSEMBLY
VA5-1 AND VA5

Name: This addition assembly card page

Note: This drawing illustrates the addition of standard top assemblies to other standard pale top assemblies.

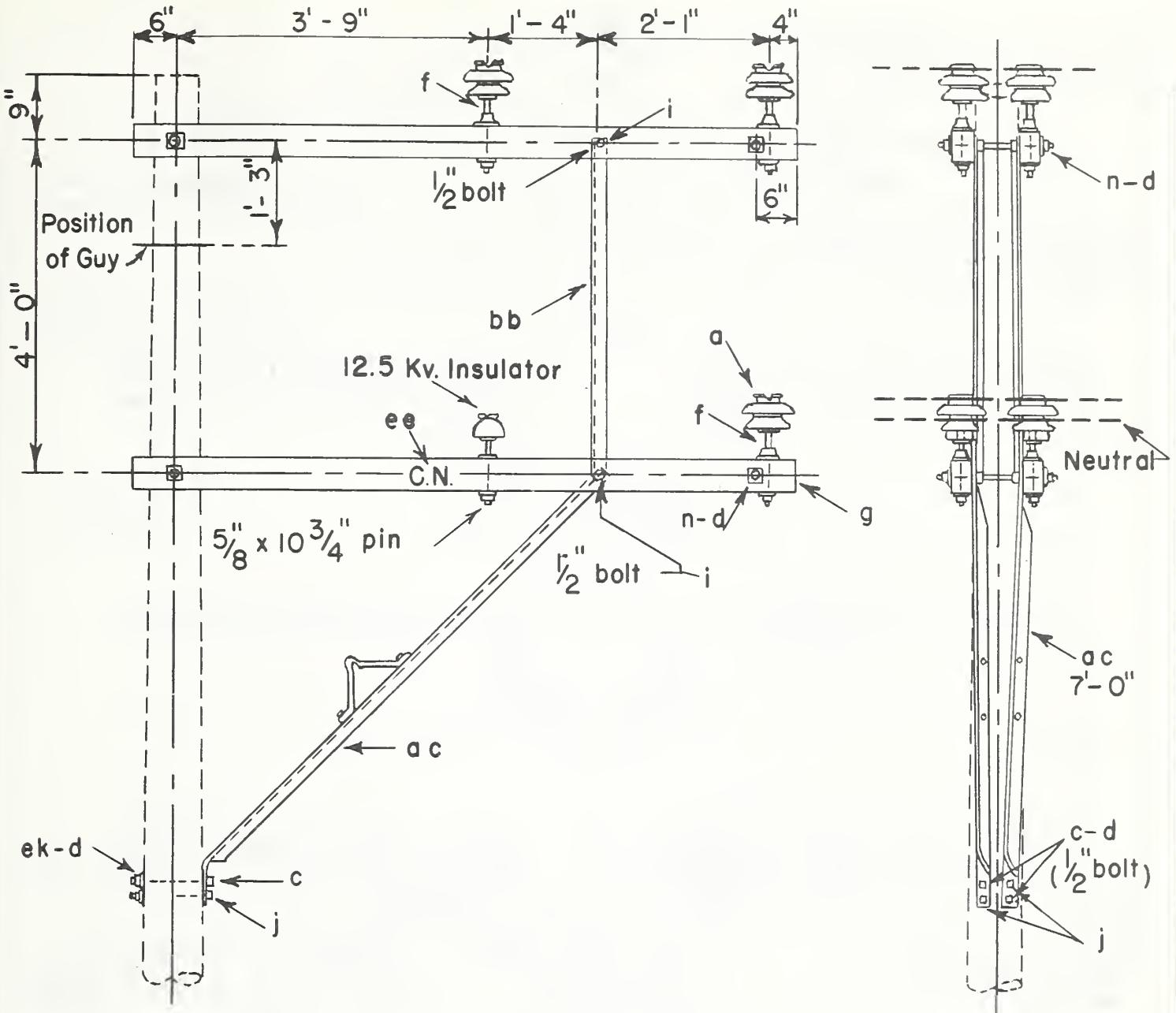
V45-3, VB4-1ANDVMO-14
COMPLETE ASSEMBLY

**COMPLETE ASSEMBLY
VA5-4, VB3 AND VMIO-14**

COMPLETE ASSEMBLY
VIA5-3, VC4-1 AND VM10-14

卷之三

TAP ASSEMBLY GUIDE



Notes:

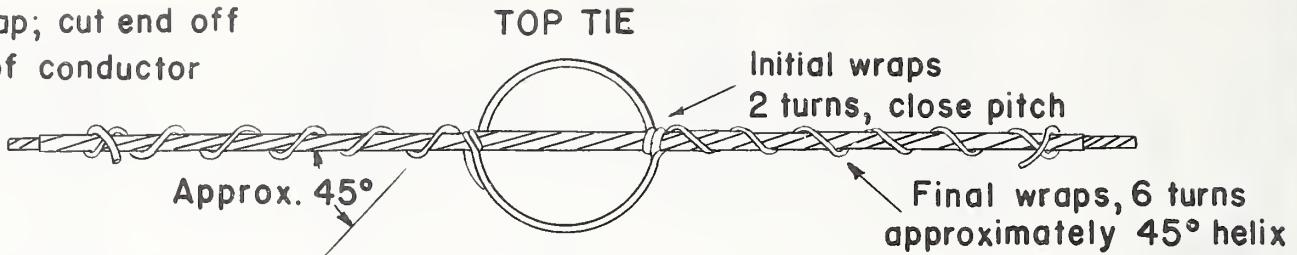
1. Where these assemblies are required, span shall be shortened, as at crossings.
2. Position of conductors on single phase and V phase to be as directed.

UNIT	ASSEMBLY	NUMBER OF EACH ITEM REQUIRED												
		DESCRIPTION	ek	a	c	d	f	g	i	j	n	ac	bb	ee
VM33-1	Single arm single phase		5	2	3	5	2	2	2	1	0	1	1	2
VM33-2	Double arm single phase		18	4	2	14	4	4	4	2	4	2	2	2
VM33-3	Single arm two phase		5	3	3	5	3	2	2	1	0	1	1	2
VM33-4	Double arm two phase		18	6	2	14	6	4	4	2	4	2	2	2
VM33-5	Single arm three phase		5	4	3	5	4	2	2	1	0	1	1	2
VM33-6	Double arm three phase		18	8	2	14	8	4	4	2	4	2	2	2

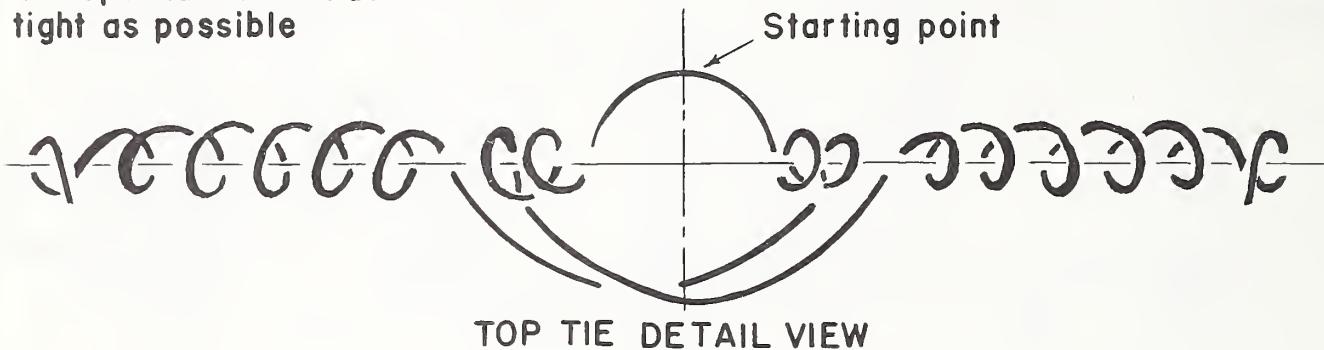
14.4/24.9 KV. PRIMARY

TWO SIDE ARMS (DOUBLE) FOR PRIMARY

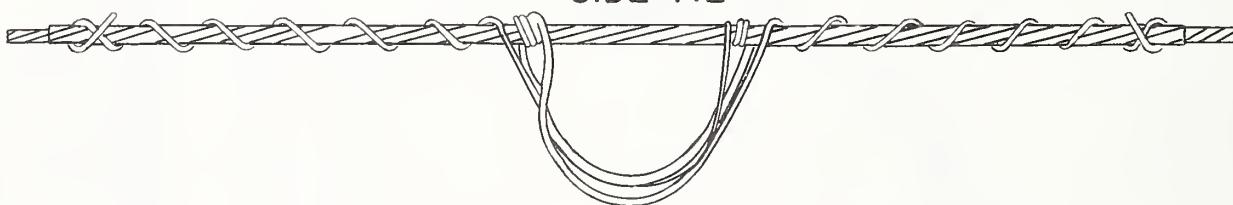
Tight wrap; cut end off
within $\frac{1}{2}$ " of conductor



All wraps must be made
as tight as possible

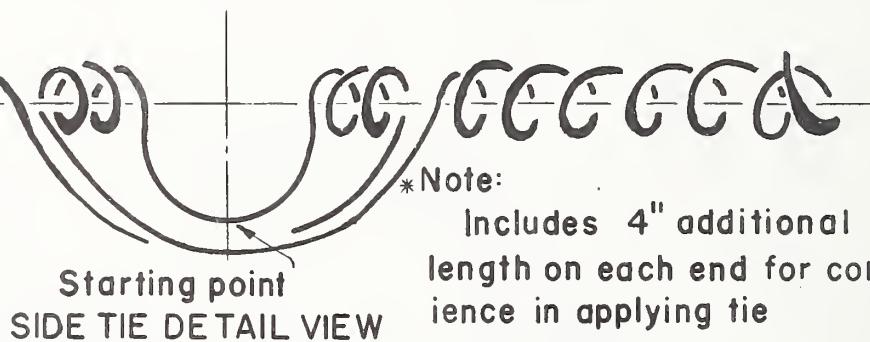


SIDE TIE



Note:

Tie wire must be
annealed copper.

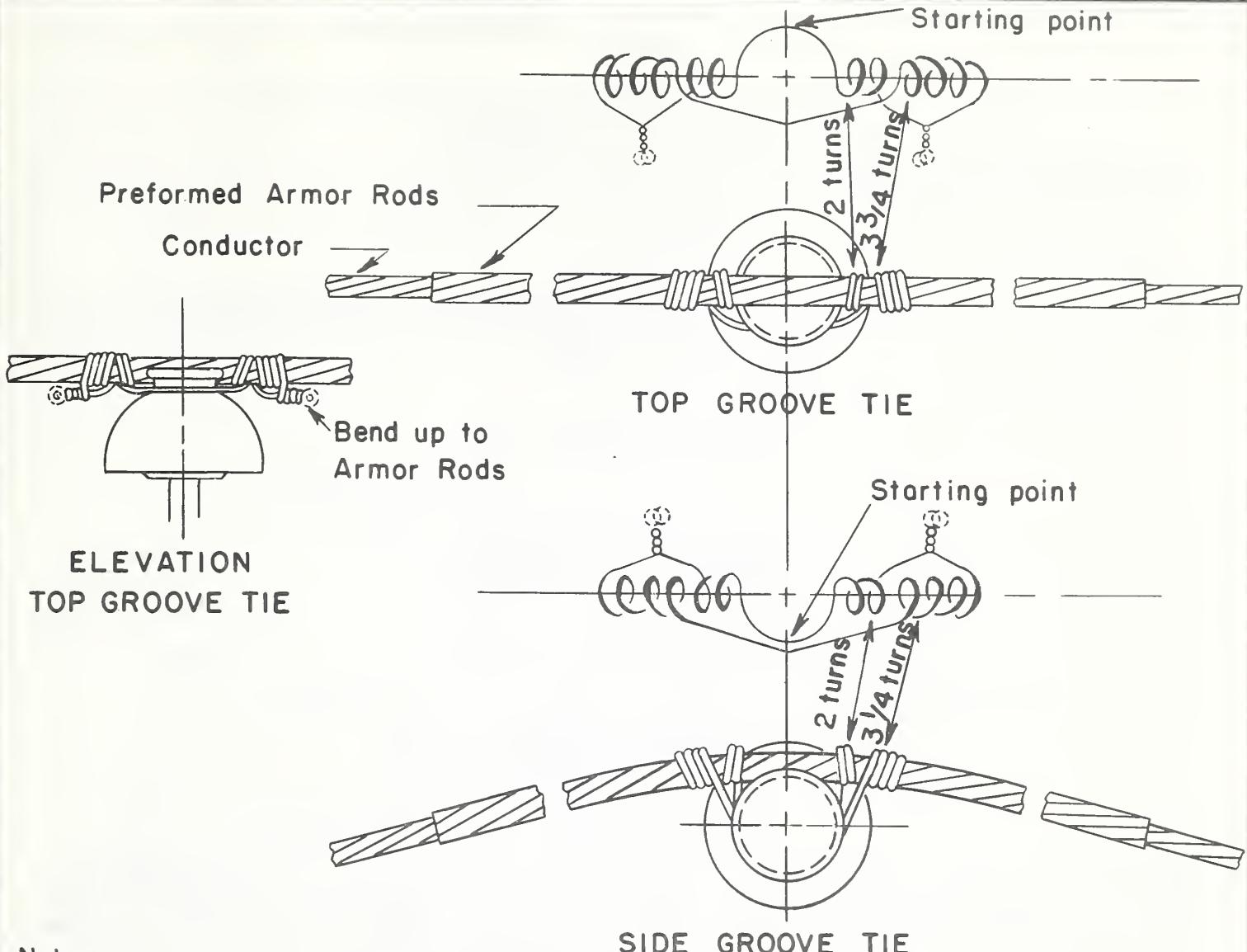


Note:

Includes 4" additional
length on each end for conven-
ience in applying tie

CONDUCTOR	CONDUCTOR DIAMETER	ARMOR ROD DIAMETER	OVERALL DIAMETER	SIZE OF COPPER TIE WIRE AWG.	TOP TIE * LENGTH	SIDE TIE * LENGTH
3/0-7 Strand HD copper	.464"	.162"	.788"	4	110"	116"
2/0-7 Strand HD copper	.414"	.162"	.738"	4	104"	110"
1/0-7 Strand HD copper	.368"	.128"	.624"	4	90"	96"
2-3 Strand copper	.320"	.128"	.576"	6	82"	88"
4A Copperweld - copper	.290"	.102"	.494"	6	72"	78"
4 Copper wire	.204"	.102"	.408"	6	66"	72"
6 Copper wire	.162"	.102"	.366"	8	60"	66"
6A Copperweld - copper	.230"	.102"	.434"	8	65"	71"
8A & 8D Copperweld - copper	.219"	.102"	.423"	8	64"	70"

TYING GUIDE, SINGLE INSULATOR
ONE PIECE TIE - COPPER TYPE CONDUCTORS
WITH PREFORMED ARMOR RODS



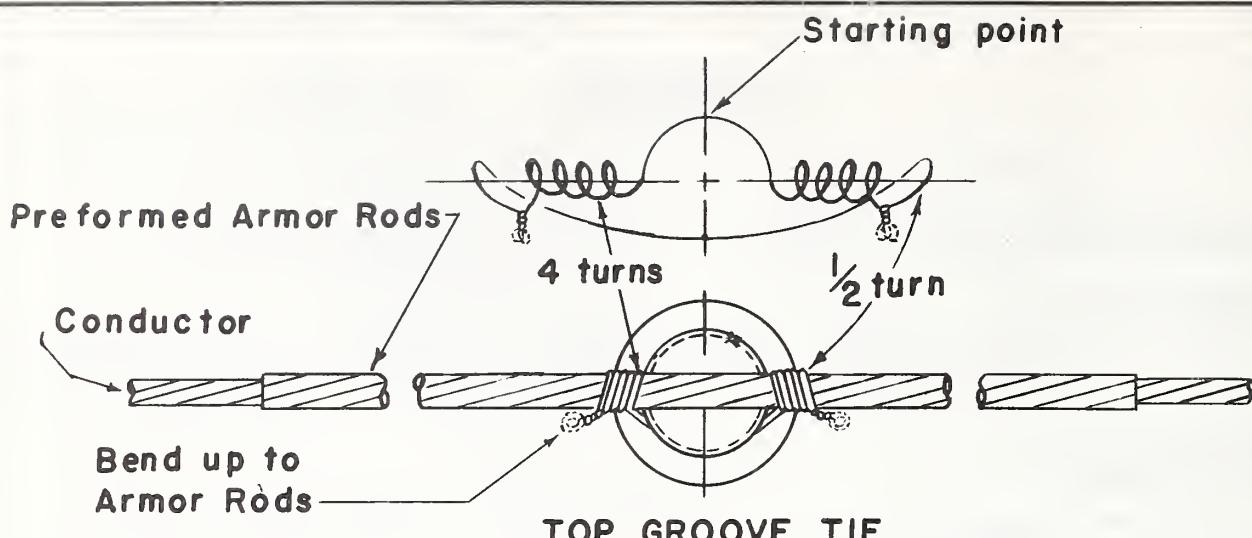
Note:

Tie wire assembly should be as tight as can be wrapped by hand, and ends twisted with pliers or hot line tools. Twist lefthand ends clockwise, righthand counterclockwise. With hot line loops, tie wires must be 8" longer than shown.

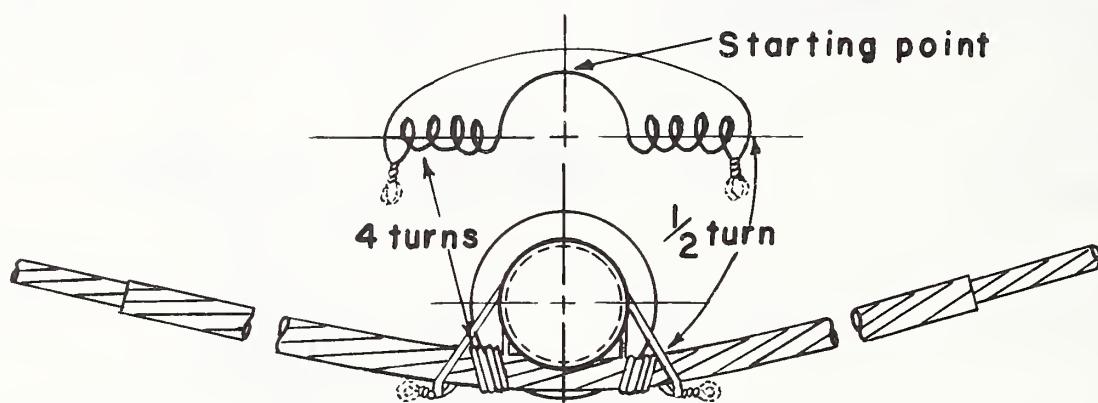
Tie wires lengths listed below can be used with insulators having neck diameter up to and including 3½".

CONDUCTOR	CONDUCTOR DIAMETER	ARMOR ROD DIAMETER	OVERALL DIAMETER	ANNEALED COPPER TIE WIRE		
				SIZE	LENGTH SHORT PIECE	LENGTH LONG PIECE
3/0 - 7 Strand HD Copper	.464"	.162"	.788"	4	27"	40"
2/0 - 7 Strand HD Copper	.414"	.162"	.738"	4	27"	40"
1/0 - 7 Strand HD Copper	.368"	.128"	.624"	4	27"	40"
2-3 Strand Copper	.320"	.128"	.576"	6	23"	35"
4A Copperweld - Copper	.290"	.102"	.494"	6	23"	35"
4 Copper wire	.204"	.102"	.408"	6	23"	35"
6 Copper wire	.162"	.102"	.366"	8	21"	30"
6A Copperweld - Copper	.230"	.102"	.434"	8	21"	30"
8A & 8D Copperweld - copper	.219"	.102"	.423"	8	21"	30"

TYING GUIDE, SINGLE INSULATOR
TWO-PIECE TIE. COPPER TYPE CONDUCTORS
WITH PREFORMED ARMOR RODS'



TOP GROOVE TIE



SIDE GROOVE TIE

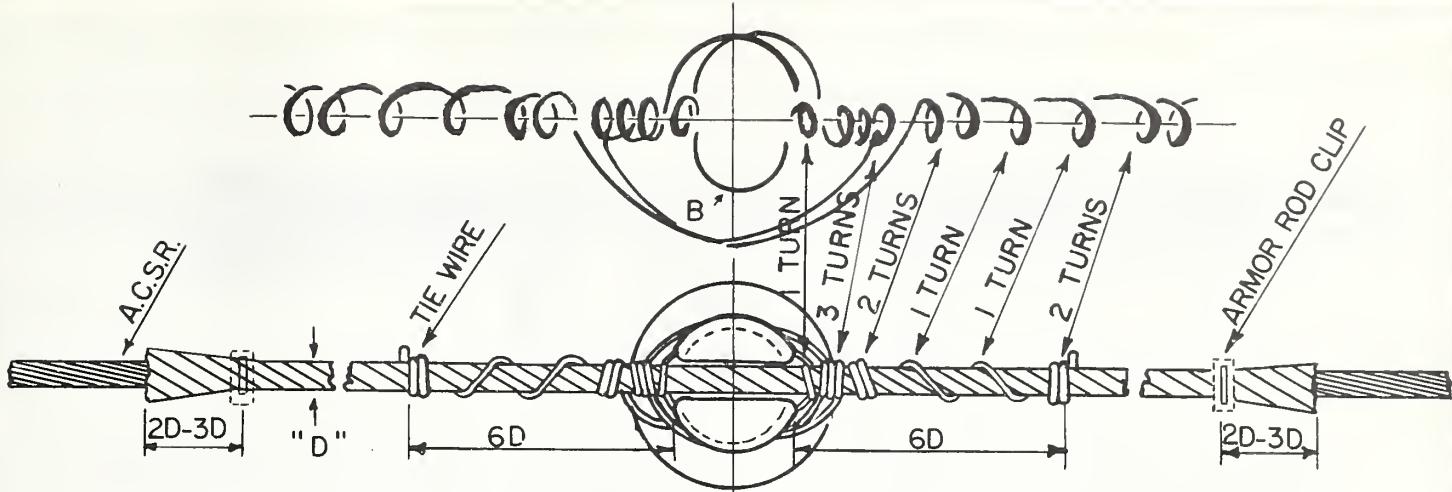
NOTE:

Tie wire assembly should be as tight as can be wrapped and ends twisted with hot line tools. Twist lefthand ends clockwise righthand counterclockwise.

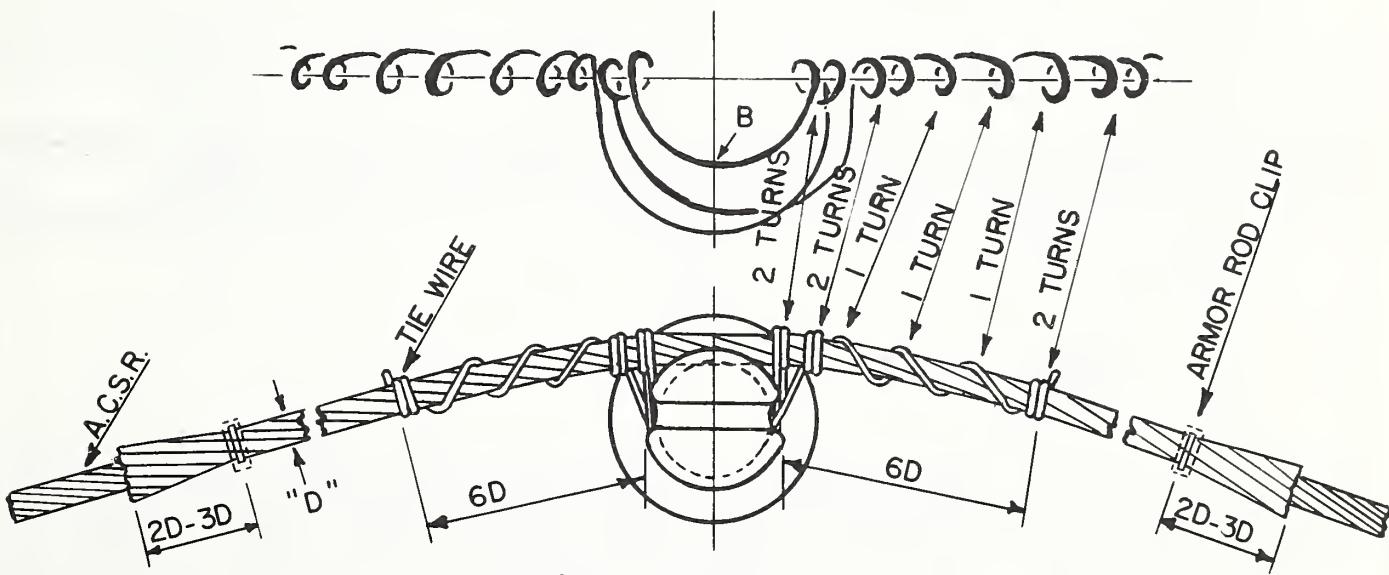
Tie wire lengths listed below can be used with insulators having a neck diameter up to and including $3\frac{1}{2}$ inches.

COPPERWELD COPPER		DIAM. OVER ARMOR RODS	ANNEALED COPPER TIE WIRE			COPPER		DIAM. OVER ARMOR RODS	ANNEALED COPPER TIE WIRE		
SIZE	COND. DIAM.		SIZE	1st AWG	2nd PIECE	SIZE	COND. DIAM.		SIZE	1st AWG	2nd PIECE
2F	.308"	.560"	6	34"	24"	4/0-7w	.522"	.846"	6	38"	29"
2A	.366	.622	6	36	24	3/0-7w	.464	.788	6	37	28
3A	.326	.582	6	34	24	2/0-7w	.414	.738	6	37	28
4A	.290	.494	6	33	24	1/0-7w	.368	.624	6	36	27
5A	.258	.462	6	33	24	2-3w	.320	.576	6	34	25
6A	.230	.434	8	32	23	2-Sol.	.258	.462	6	33	24
7A	.223	.427	8	32	23	4-Sol.	.204	.408	6	32	23
8A	.199	.403	8	31	23	6-Sol.	.162	.366	8	30	22

HOT LINE TYING GUIDE
COPPER TYPE CONDUCTORS
WITH PREFORMED ARMOR RODS



TOP GROOVE DOUBLE TIE



SIDE GROOVE TIE

Note:

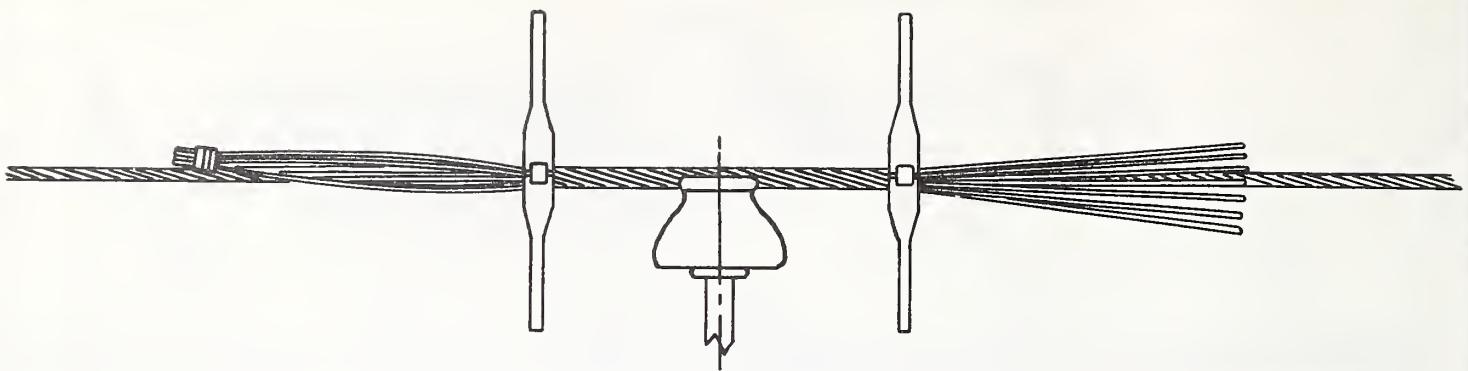
In making ties, start with middle of length of tie wire at position marked "B".

To complete tie, cinch up last two turns at each end with pliers until tie wire is snug and tight.

Use the flat face of the pliers against the armor rods.

A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM		A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM	
Size	DIAM. INCHES	"D" DIAM. INCHES	Size	LENGTH FEET	Size	DIAM. INCHES	"D" DIAM. INCHES	Size	LENGTH FEET
4/0	0.563	0.939	4	9' 3"	1/0	0.398	0.744	4	8' 3"
3/0	0.502	0.836	4	8' 9"	2	0.325	0.595	4	7' 5"
2/0	0.447	0.745	4	8' 3"	4	0.257	0.555	4	7' 3"

TYING GUIDE, SINGLE INSULATOR,
ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR,
STRAIGHT OR PREFORMED ARMOR RODS

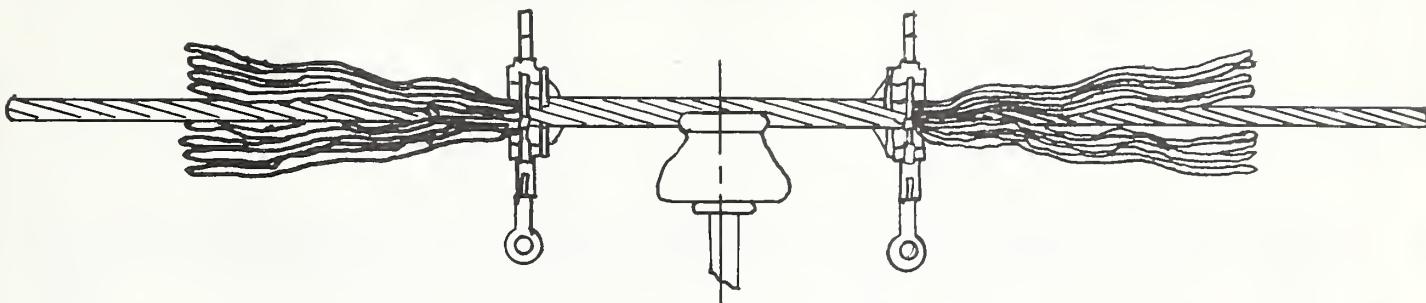


Note:

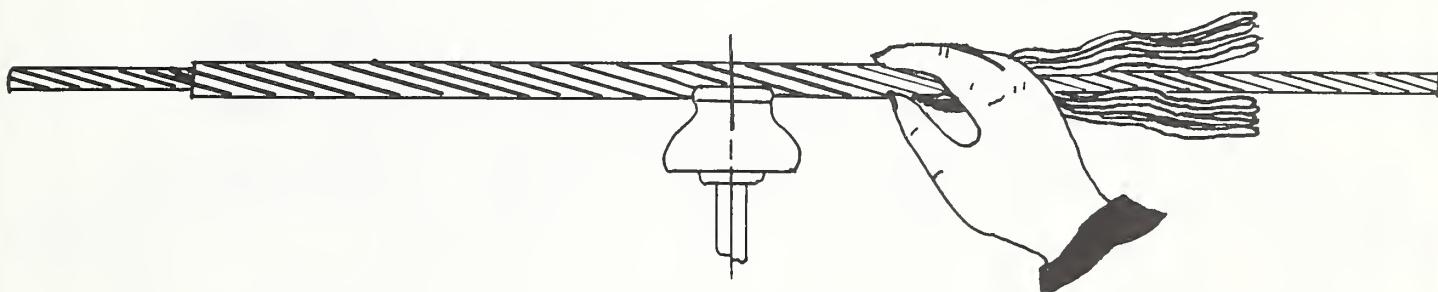
With tape still on one end of rods and other end threaded through wrenches so they open between the same two rods, center on conductor over point of support and close around conductor as shown above. Twist rods enough to give permanent set. Remove tape and slide wrenches half way to ends and repeat. Move wrenches to end of rods and twist. Attach clips and tighten before removing so end of rods will flare after removal. Rods should be twisted snugly with a smooth lay in same direction as lay of conductor. For further information and method of installing rods on angle see manufacturer's instructions for Construction.

Conductor Size	Support	
	Single	Double
	Twists	
*4 A.C.S.R.(6AI/1St.) & (7AI/1St.)	5 - 6	7 - 8
*2 A.C.S.R.(6AI/1St.) & (7AI/1St.)	6 - 7	8 - 9
*1/0 A.C.S.R. (6AI/1St.)	4 - 5	6 - 7
# 2/0 A.C.S.R. (6AI/1St.)	5 - 6	7 - 8
# 3/0 A.C.S.R. (6AI/1St.)	5 - 6	7 - 8
# 4/0 A.C.S.R. (6AI/1St.)	5 - 6	7 - 8

ARMOR RODS
A.C.S.R. CONDUCTOR



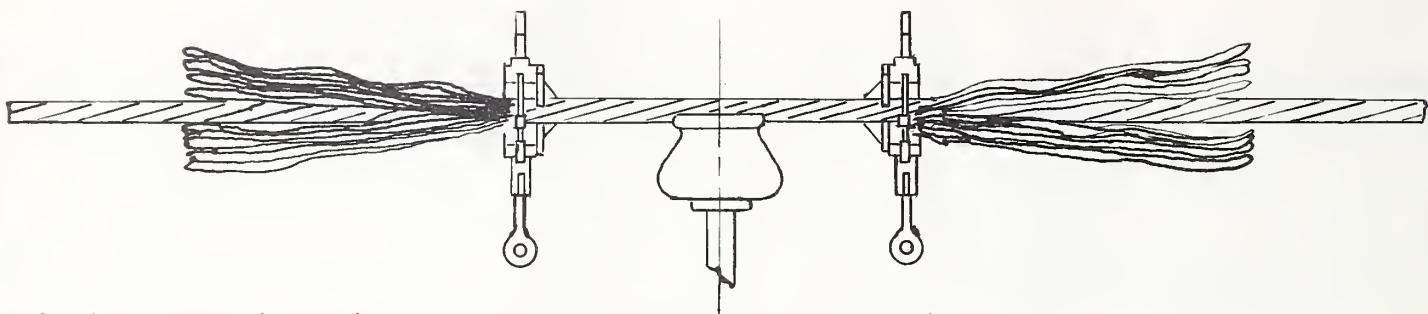
For tool application, insert half the reinforcements in one cavity and the other half in the other cavity of the open wrenches, keeping the ends even. Hook wrenches over the conductor and close jaws. Space wrenches approximately one reinforcement pitch apart and twist them in the same direction as the lay of the conductor. Wind each wrench to the end of the reinforcements and remove.



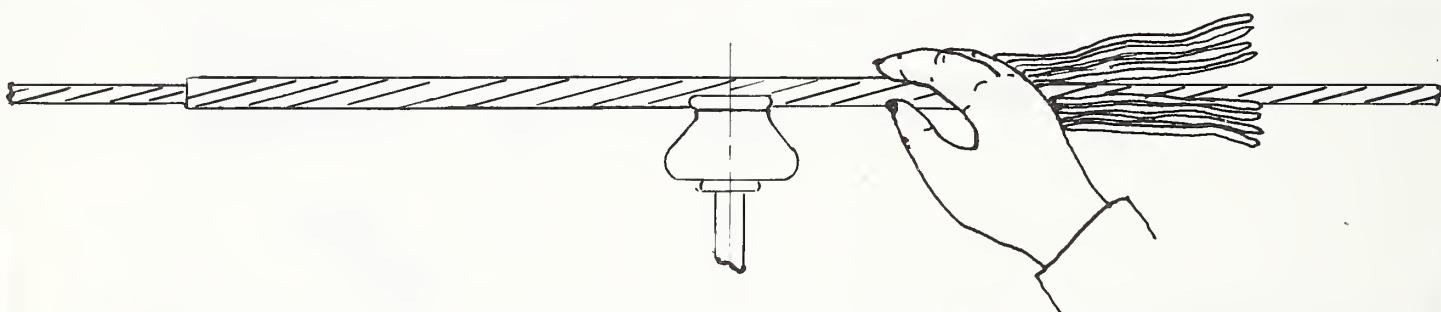
For hand application, hold one or more reinforcements against the conductor with midpoint at the insulator, and rotate in same direction as the lay of the conductor, for three or four inches each side of center. In like manner apply remaining reinforcements to center section. After all have been started, complete the application by a rotary outward wiping motion of the hand. Make certain that the ends snap into place in proper order.

PREFORMED ALUMINUM ALLOY ARMOR RODS												
A.C.S.R.	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM., (IN.)	DIAM. PLUS RODS	A.C.S.R.	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM., (IN.)	DIAM. PLUS RODS	
4/0(6x1)	60"	72"	11	.182	.927	2(7x1)	44"	56"	9	.146	.613	
3/0(6x1)	56"	68"	11	.167	.836	2(6x1)	44"	56"	9	.146	.604	
2/0(6x1)	54"	66"	10	.167	.781	4(7x1)	40"	52"	7	.146	.545	
1/0(6 x1)	52"	64"	9	.167	.732	4(6x1)	40"	52"	7	.146	.538	
1(6x1)	48"	60"	9	.146	.643							

PREFORMED ARMOR RODS
A.C.S.R. CONDUCTORS



For tool applications, insert half the reinforcements in one cavity and the other half in the other cavity of the open wrenches, keeping the ends even. Hook wrenches over the conductor and close jaws. Space wrenches approximately one reinforcement pitch apart and twist them in the same direction as the lay of the conductor. Wind each wrench to the end of the reinforcements and remove.



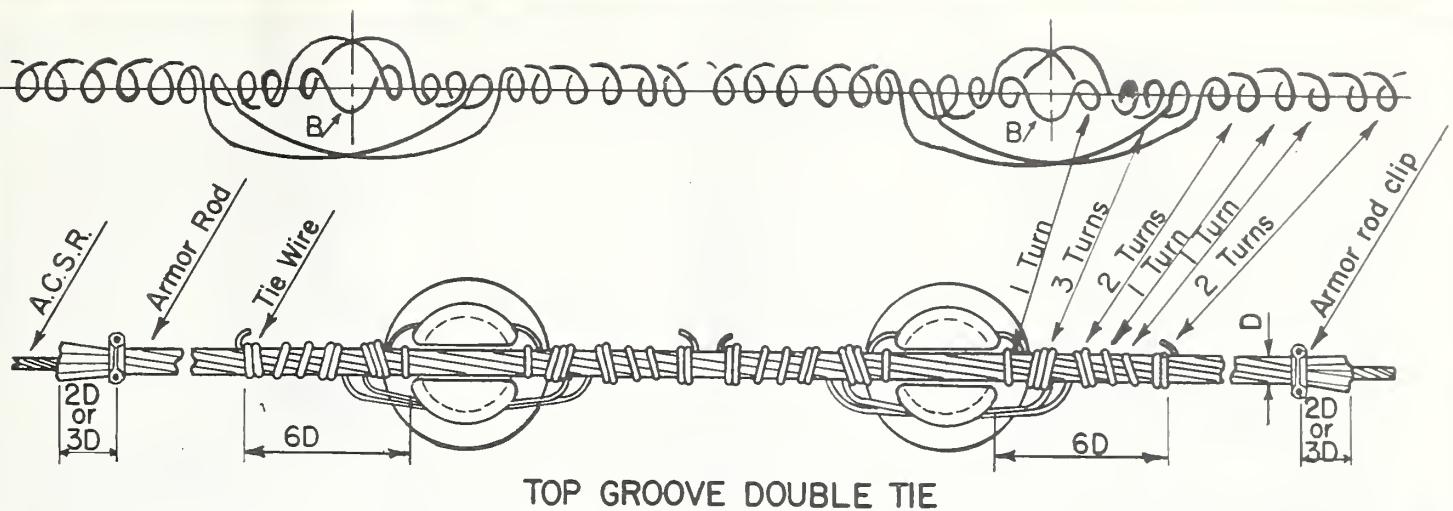
For hand application, hold one or more reinforcements against the conductor with midpoint at the insulator and rotate in same direction as the lay of the conductor, for three or four inches each side of center. In like manner apply remaining reinforcements to center section. After all have been started, complete the application by a rotary outward wiping motion of the hand. Make certain that the ends snap into place in proper order.

If lay of conductor is right-hand instead of as indicated, special armor rods should be obtained with the same lay.

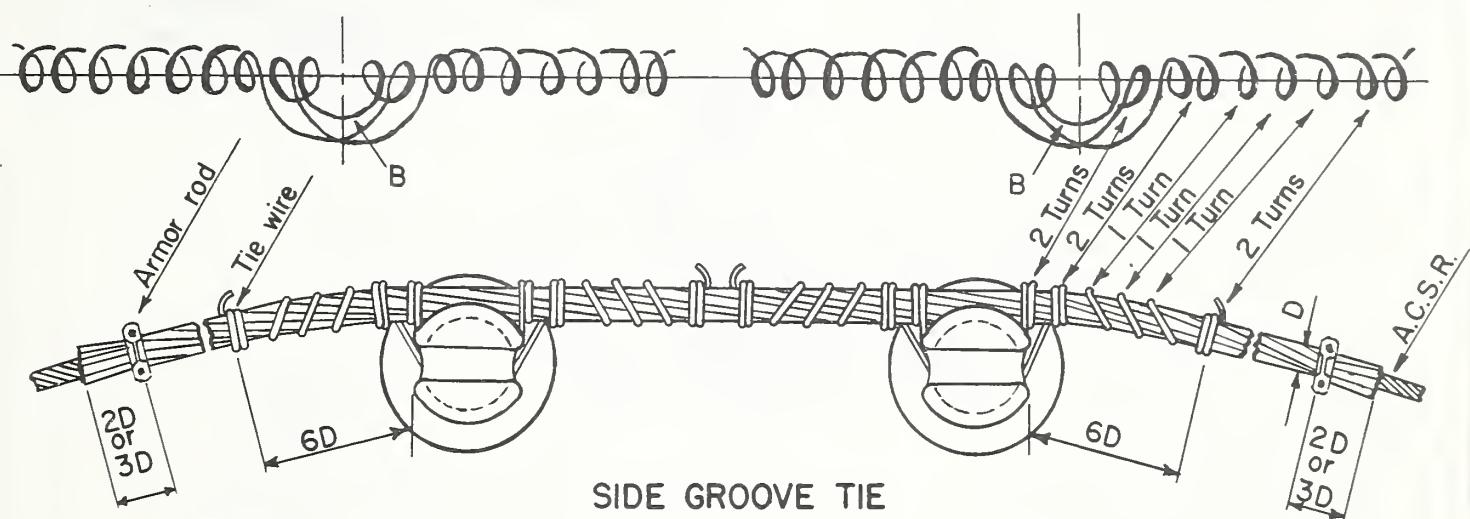
PREFORMED BRONZE OR COPPER TYPE ARMOR RODS

CONDUCTOR	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM	DIAM. PLUS RODS	CONDUCTOR	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM	DIAM. PLUS RODS
3/0 x 7	56"	68"	11	.162	.788	4 Solid	40"	52"	8	.102	.408
2/0 x 7	56"	68"	10	.162	.738	6 Solid	40"	52"	7	.102	.366
1/0 x 7	50"	62"	10	.128	.624	6 A.CWC	40"	52"	9	.102	.434
2 x 3	46"	58"	9	.128	.576	8 A.CWC	40"	52"	8	.102	.403
4 A.CWC	42"	54"	10	.102	.494						

PREFORMED ARMOR RODS COPPER TYPE CONDUCTORS



TOP GROOVE DOUBLE TIE



SIDE GROOVE TIE

Note:

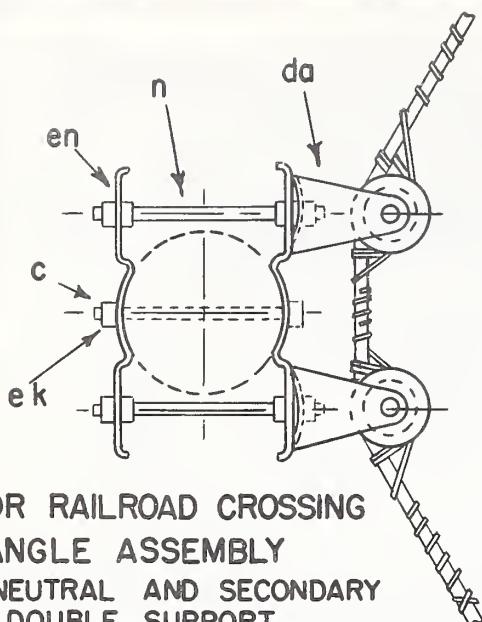
In making ties, start with middle of length of tie wire at position marked "B".

To complete tie, cinch up last two turns at each end with pliers until tie wire is snug and tight.

Use the flat face of the pliers against the armor rods.

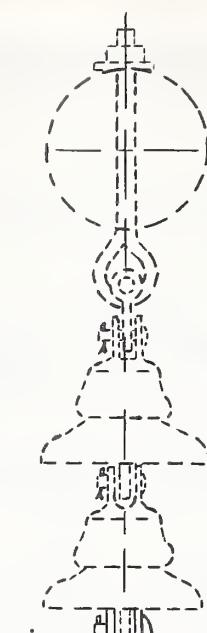
A.C.S.R.		ARMOR RODS		TIE WIRE ALUMINUM		A.C.S.R.		ARMOR RODS		TIE WIRE ALUMINUM	
SIZE	DIAM. INCHES	"D" DIAM. INCHES	SIZE	LENGTH FEET	SIZE	DIAM. INCHES	"D" DIAM. INCHES	SIZE	LENGTH FEET	SIZE	LENGTH FEET
4/0	0.563	0.939	4	9'-3"	1/0	0.398	0.744	4	8'-3"		
3/0	0.502	0.836	4	8'-9"	2	0.325	0.595	4	7'-5"		
2/0	0.447	0.745	4	8'-3"	4	0.257	0.555	4	7'-3"		

TYING GUIDE, DOUBLE INSULATOR,
ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR,
STRAIGHT OR PREFORMED ARMOR RODS



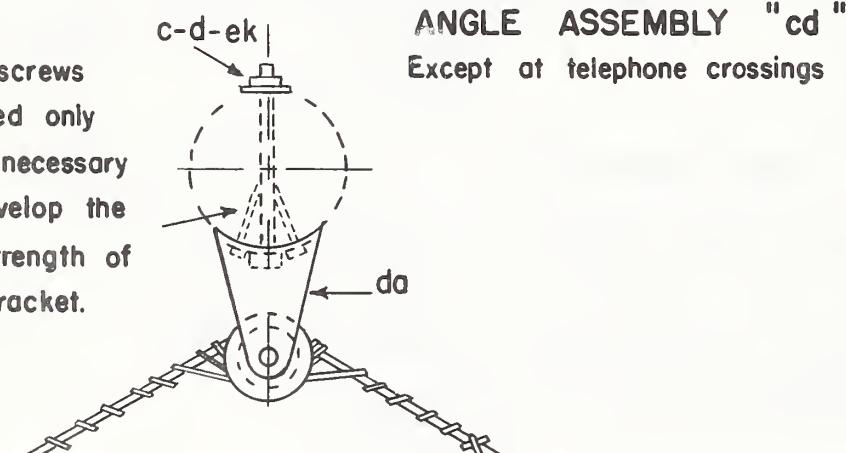
FOR RAILROAD CROSSING
ANGLE ASSEMBLY
NEUTRAL AND SECONDARY
DOUBLE SUPPORT

Use suspension clamp item "m"
for conductors with armor rods
exceeding 3/4" overall diameter.



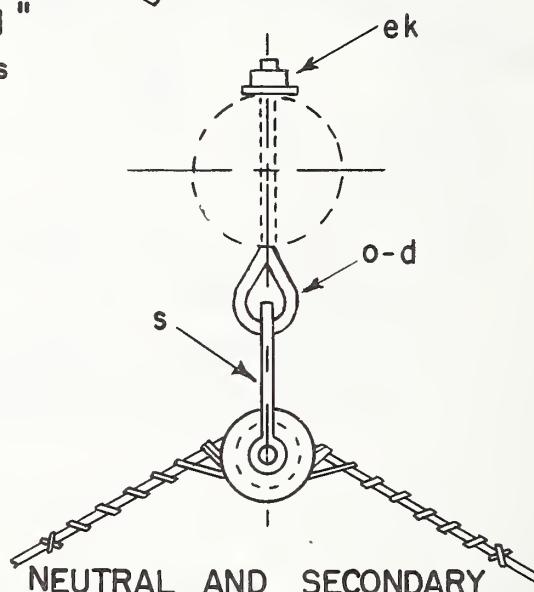
FOR TELEPHONE CROSSING
ANGLE ASSEMBLY "cd"
with 2-bolt suspension clamp

Lag screws
required only
when necessary
to develop the
full strength of
the bracket.



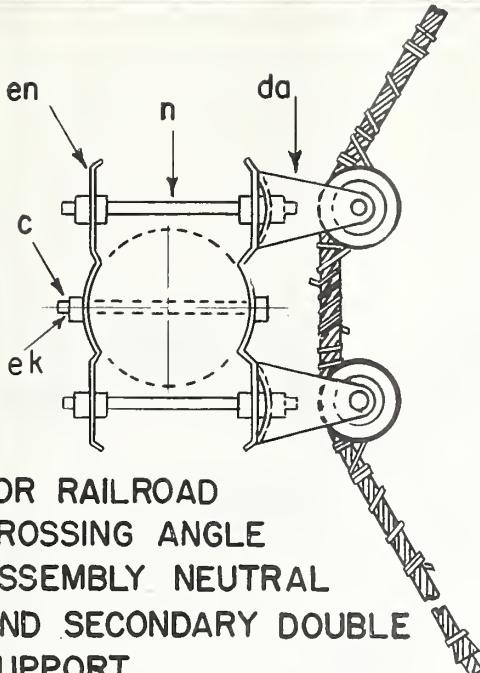
ANGLE ASSEMBLY "cd"
Except at telephone crossings

NEUTRAL AND SECONDARY
ASSEMBLY "ce"
Except at railroad crossings

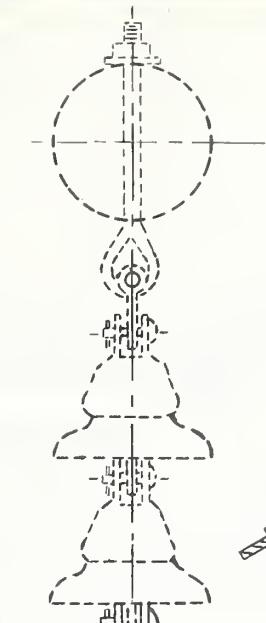


NEUTRAL AND SECONDARY
ANGLE ASSEMBLY "ce"
Except at railroad crossings

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c		Bolt, machine, 5/8" x req'd. length	bo		Shackle, anchor
m		Clamp, suspension	da		Bracket, insulated
n		Bolt, double arming	ci		Clevis, thimble, side opening
s		Clevis, secondary, swinging, insulated	en		Plates, double support
ek		Locknuts			
d		Washer, square, 2 1/4"			
j		Screw, lag, 1/2"x 4"			
o		Bolt, eye, 5/8"x req'd. length			
ANGLE ASSEMBLY GUIDE, VERTICAL CONSTRUCTION 30° TO 60° ANGLE, COPPER TYPE CONDUCTORS WITH PREFORMED RODS					
Jan 1, 1962			M 4I-1		



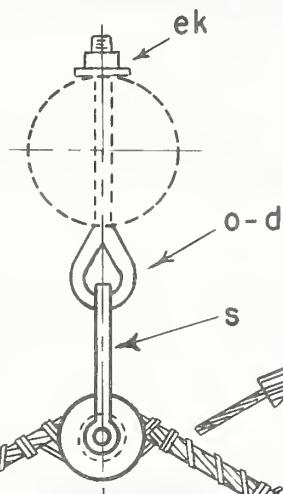
FOR RAILROAD
CROSSING ANGLE
ASSEMBLY NEUTRAL
AND SECONDARY DOUBLE
SUPPORT.



FOR TELEPHONE CROSSING
ANGLE ASSEMBLY "cd"
with 2-bolt suspension clamp

Armor rods
and clips

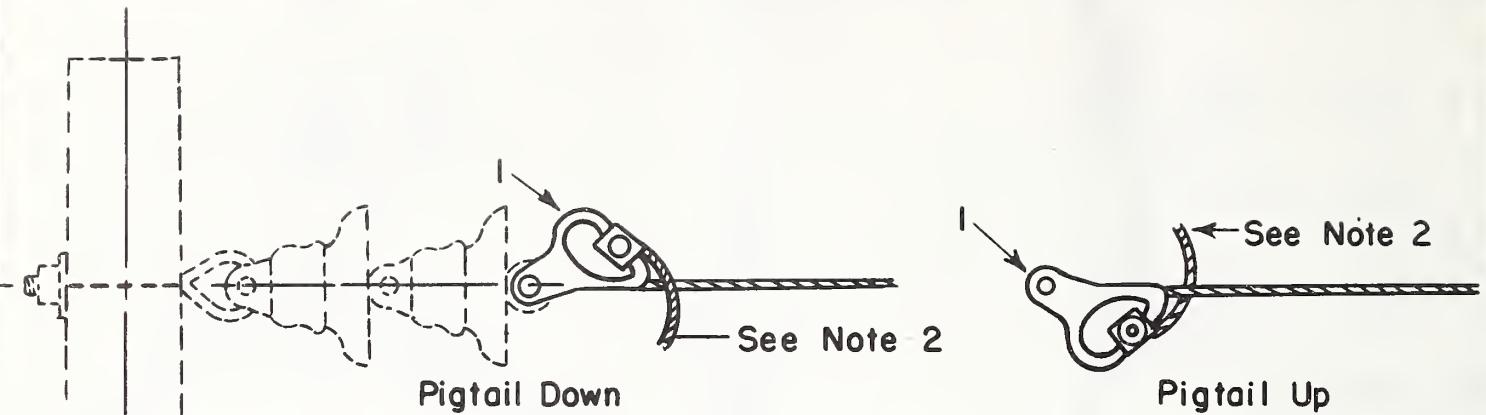
PRIMARY
ANGLE ASSEMBLY "cd"
except at telephone crossings



NEUTRAL AND SECONDARY
ASSEMBLY "ce"
except at railroad crossings

NEUTRAL AND SECONDARY
ANGLE ASSEMBLY "ce"
except at railroad crossings

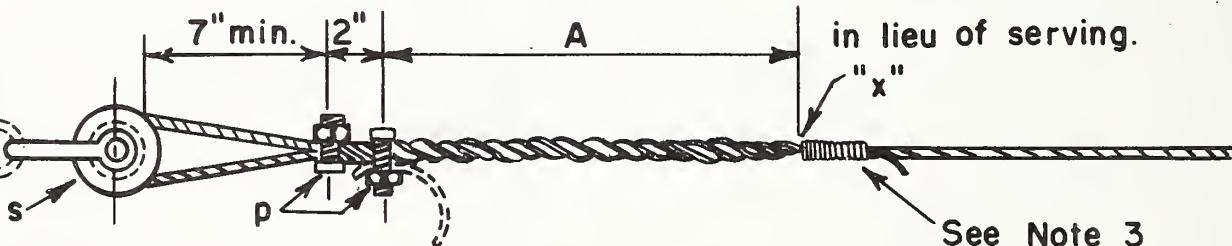
ITEM NO.	MATERIAL	ITEM NO.	MATERIAL
c	Bolt, machine, 5/8" x req'd. length	bo	Shackle, anchor
m	Clamp, suspension	da	Bracket, insulated
n	Bolt, double arming	en	Plates, double support
s	Clevis, secondary, swinging, insulated	o	Bolt, eye, 5/8" x required length
ek	Locknuts		
d	Washer, square, 2 1/4"		
j	Screw, lag, 1/2" x 4"		
ANGLE ASSEMBLY GUIDE, VERTICAL CONSTRUCTION 30° TO 60° ANGLE, ACSR CONDUCTORS WITH STRAIGHT OR PREFORMED ARMOR RODS			
Jan 1, 1962		M4I-10	



**PRIMARY
DEADEND ASSEMBLY "ca"**

Note:

For solid conductors
use third connector at "x"
in lieu of serving.



**NEUTRAL & SECONDARY
DEADEND ASSEMBLY "cc"**

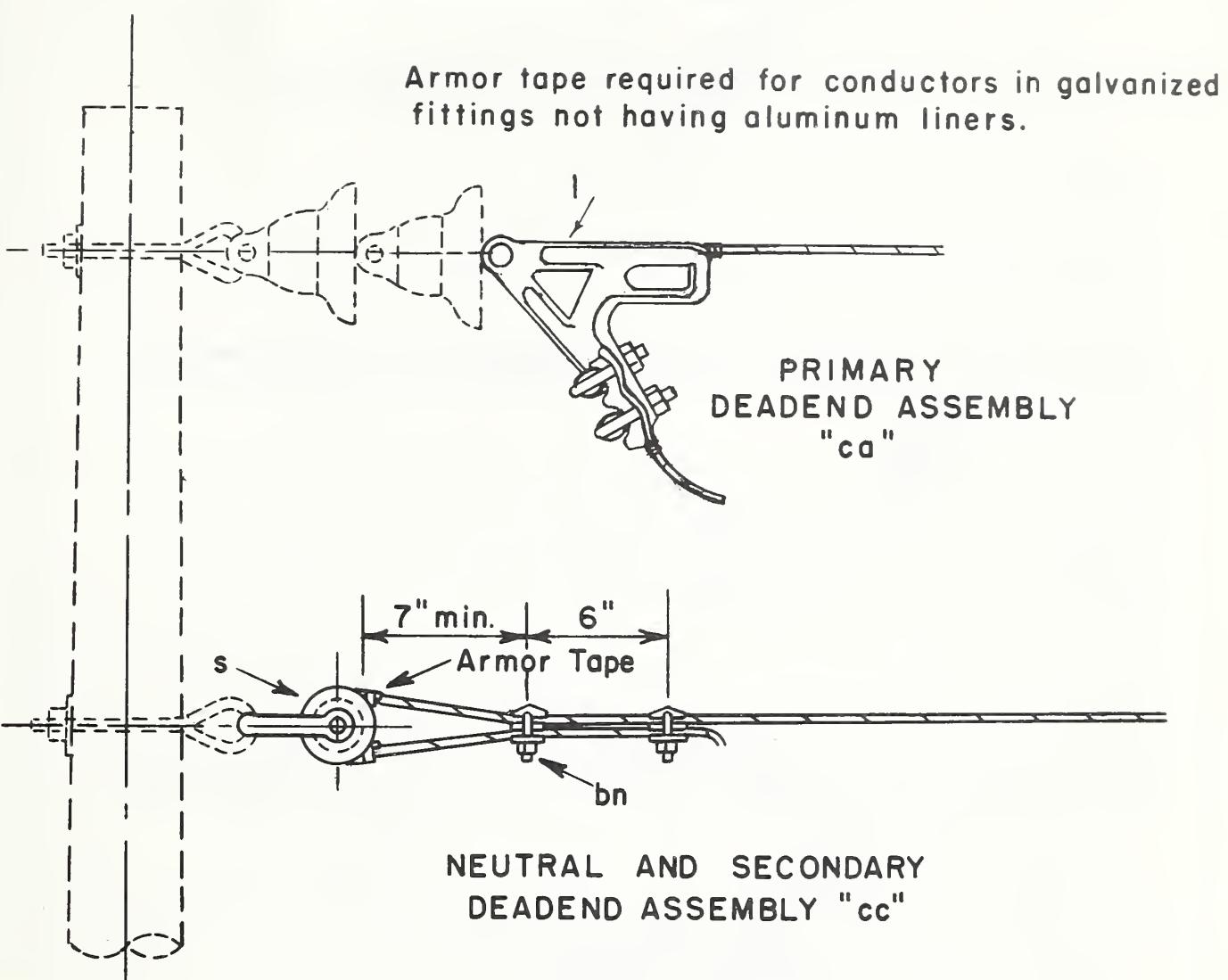
SIZE OF CONDUCTOR	A
No. 8 D Copperweld - Copper	20"
No. 8A Copperweld - Copper	18"
No. 6A Copperweld - Copper	20"
No. 4A Copperweld - Copper	22"
No. 2 Copper, 3 - Strand	22"

Notes:

1. - For alternate method of deadending primary conductors, see Drawing M 42-21.
2. Bend pigtail away from line conductor to avoid chafing.
3. Wrap free end of conductor along line conductor using same lay. Extend one strand of free end (for copperweld-copper this is the copperweld strand) against line conductor. Serve the other two strands six turns each and cut them off. (Always serve copper strand (s) first.) Bend extended strand away from line conductor and cut off.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
I		Clamp, deadend	s		Clevis, secondary, swinging, insul.
P		Connectors, as req'd			

**DEADEND ASSEMBLY GUIDE - DEADEND CLAMP METH.
COPPERWELD COPPER & COPPER CONDUCTORS**

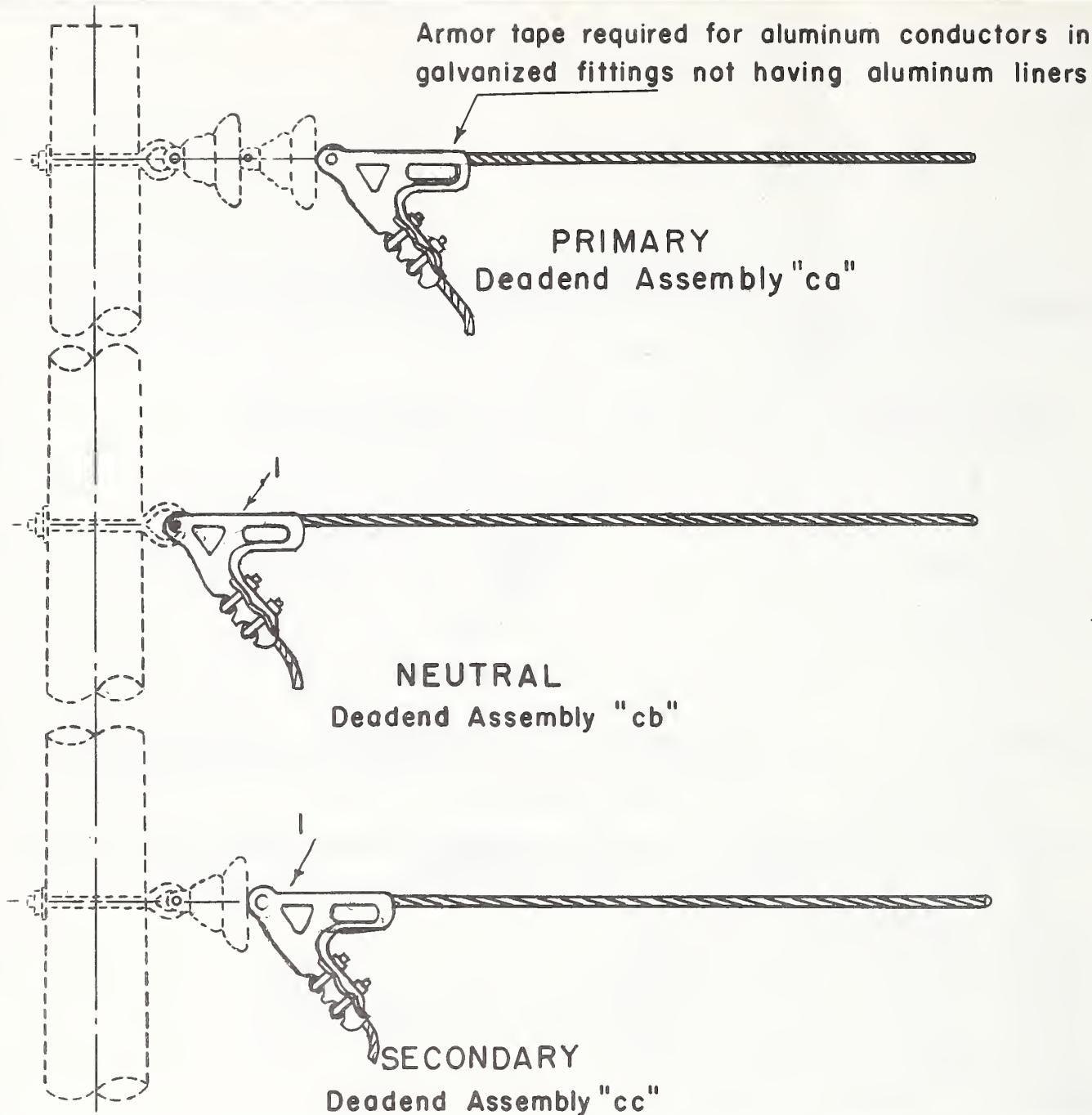


Notes:

1. - Armor tape wrapping to extend not more than two wraps beyond the mouth of deadend clamp or spool insulator.
2. For I/O and larger use spool of 3" min. groove diameter on neutral and secondary deadends.

ITEM	MATERIAL	ITEM	MATERIAL
I	Clamp, deadend		
s	Clevis, secondary, swinging, insulated		
bn	Clamp, loop deadend		

DEADEND ASSEMBLY GUIDE
DEADEND CLAMP METHOD
A.C.S.R. CONDUCTORS



ITEM	NO. REDD	MATERIAL	ITEM	NO. REDD	MATERIAL
I		Clamp, deadend			

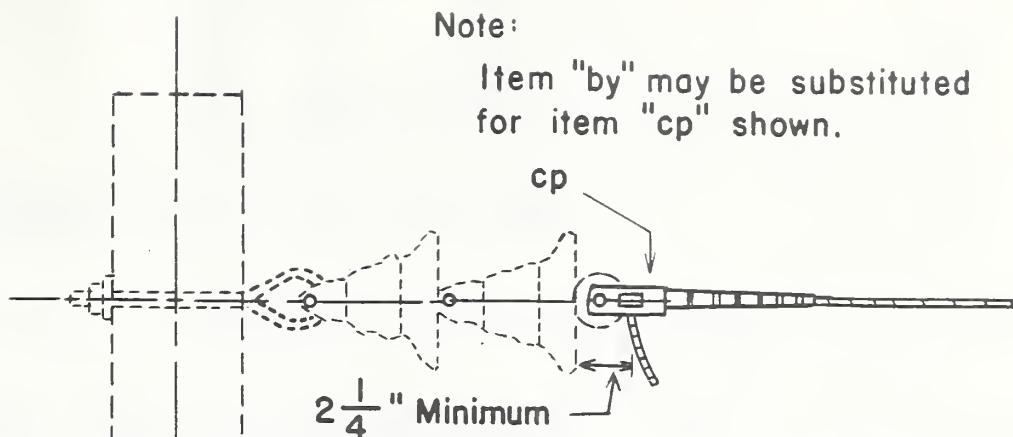
DEADEND ASSEMBLY GUIDE
(LARGE CONDUCTORS)

Jan 1, 1962

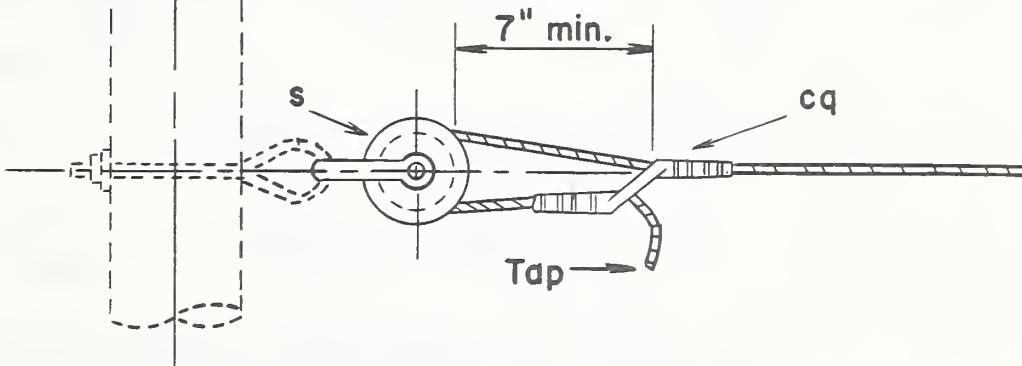
M42-13

Note:

Item "by" may be substituted
for item "cp" shown.



PRIMARY
DEADEND ASSEMBLY "ca"



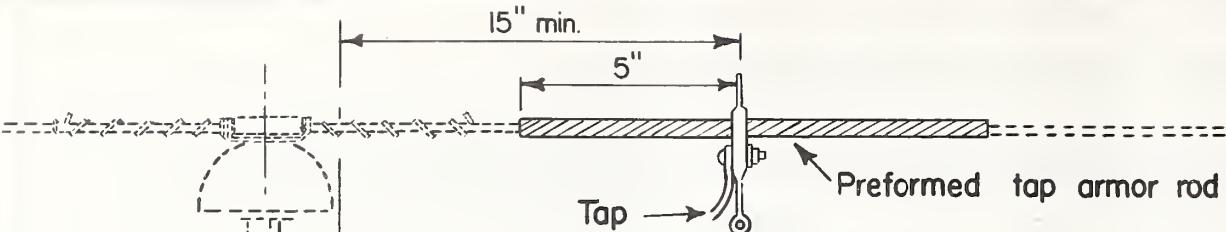
NEUTRAL AND SECONDARY
DEADEND ASSEMBLY "cc"

ITEM NO. REQD	MATERIAL	ITEM NO. REQD	MATERIAL
s	Clevis, secondary, swinging, insulated	cq	Sleeve, offset, splicing
cp	Sleeve, deadend, compression		

DEADEND ASSEMBLY GUIDE-COMPRESSION METHOD
COPPER TYPE CONDUCTORS

Jan 1, 1962

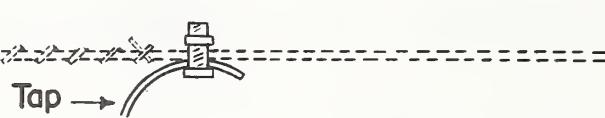
M42-21



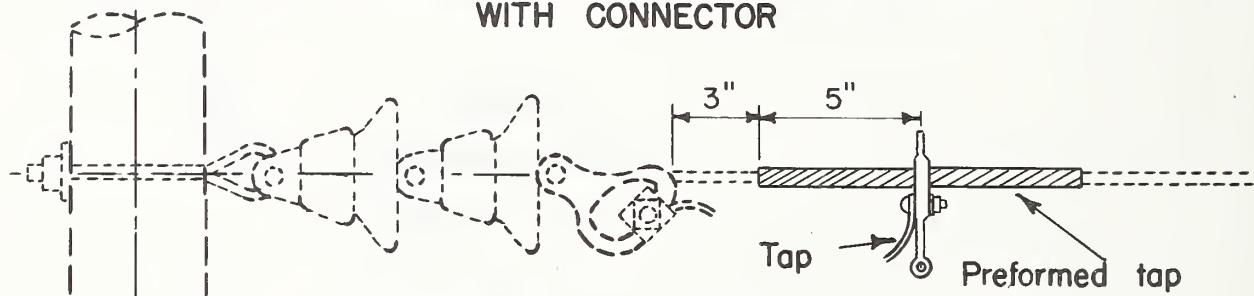
TAP FROM PRIMARY LINE

Note:

To be used on existing construction where full length armor rods were not installed.

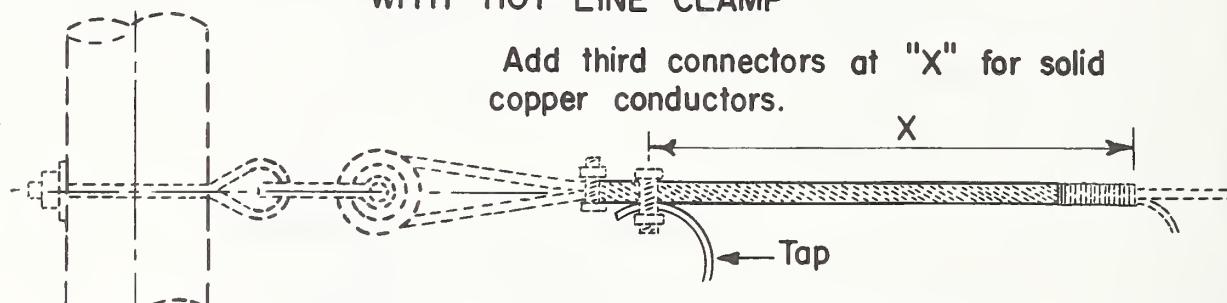


TAP FROM NEUTRAL OR SECONDARY LINE WITH CONNECTOR



TAP FROM PRIMARY DEADEND WITH HOT LINE CLAMP

Add third connectors at "X" for solid copper conductors.



TAP FROM NEUTRAL OR SECONDARY DEADEND

Notes:

I. Arrangement shown on M42-II may be used for neutral and secondary deadend if preferred.

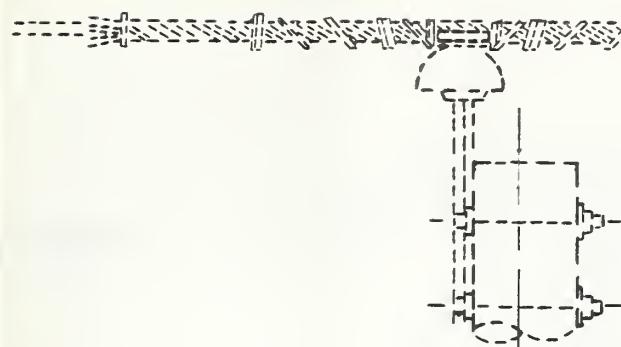
2. When installing armor rods on existing lines, both conductor and armor rods should be wire brushed to provide clean contact surfaces. A corrosion inhibitor should be applied before or immediately after brushing.

3. Taps to be slack.

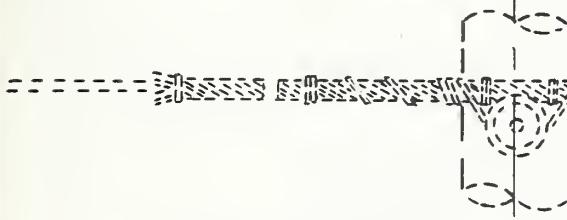
Size of solid conductor	X
No. 6 Copper	18"
No. 4 Copper	20"

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
P		Connectors, as required	bv		Tap armor rods, bronze
ap		Clamp, hot line, tap assembly			

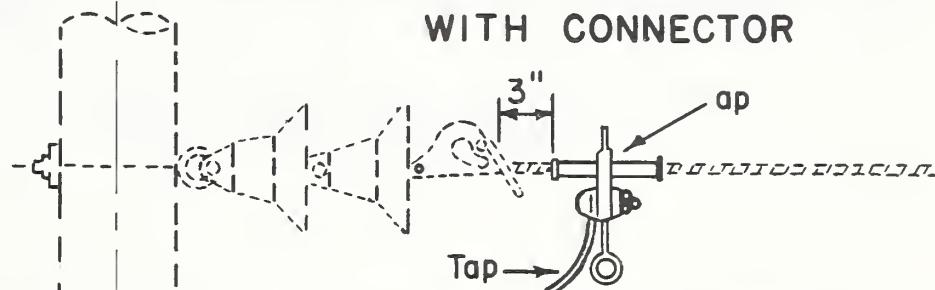
TAP ASSEMBLY GUIDE COPPERWELD-COPPER AND COPPER CONDUCTORS



**TAP FROM PRIMARY LINE
WITH HOT LINE CLAMP**



**TAP FROM NEUTRAL OR SECONDARY LINE
WITH CONNECTOR**



**TAP FROM PRIMARY DEADEND
WITH HOT LINE CLAMP**

For tap without hot line clamp omit
tap saddle and extend pigtail.



TAP FROM NEUTRAL OR SECONDARY DEADEND

Notes:

1. Wire brush conductor thoroughly before applying tap saddle.
2. On new construction, tap may be made directly over armor rods provided conductor is thoroughly cleaned and inhibitor used before installing rods.
3. Tap armor rods may be substituted for tap saddle provided conductor is wire brushed thoroughly and inhibitor is used before installing rods.

ITEM	NO. REFR	MATERIAL			MATERIAL
p		Connector	et		Tap saddle
ap		Clamp, hot line, tap assembly			

**TAP ASSEMBLY GUIDE
A.C.S.R. CONDUCTORS**

Marking will vary
according to sleeve.



COPPER COMPRESSION SLEEVE
BEFORE SPLICING

Number of presses will
vary with sleeve length.



COPPER COMPRESSION SPLICE COMPLETE

NOTE:

Clean the wire with abrasive cloth before making the splice.

Splice shall not be within 10 feet of insulator.

Begin presses at center of sleeve and work toward ends, press entire length of sleeve, spacing presses about $1/16"$ to $1/8"$ apart.

Groove letters printed on sleeves correspond to groove letters printed on tool.

SPLICING GUIDE-COMPRESSION TYPE
COPPER TYPE CONDUCTORS

Jan 1, 1962

M45-20



ALUMINUM SLEEVE

STEEL SLEEVE

Sleeves are marked to indicate conductor size



A.C.S.R. READY FOR SPLICING

Aluminum sleeve slipped back on cable



STEEL SLEEVE PRESSED

ON STEEL CORE

Friction Tape



COMPLETED SPLICE

DIRECTIONS FOR MAKING A.C.S.R. SPLICE

1. Slip Aluminum Sleeve on cable far enough back to be out of the way. Cut back Aluminum Strands at end of cable $\frac{3}{8}$ " more than half the length of steel sleeve.
2. Insert steel core wires in the steel sleeve and press with inner groove of tool. Press entire length of sleeve starting at the middle and working toward the ends. Leave about $\frac{1}{16}$ " space between presses.
3. Straighten steel sleeve by hammering carefully against a suitable block.
4. Place a piece of friction tape on the cable to mark the position of the end of the Aluminum sleeve such that it will be centered on the splice.
5. Clean conductor by wirebrushing, paint the steel sleeve and the adjacent cable that will be covered by the aluminum sleeve, with a suitable corrosion inhibitor.
6. Slip the Aluminum sleeve in place and press with the outer groove of tool using the same procedure as with the steel sleeve.
7. Straighten entire splice by hammering carefully against a suitable block.
8. Splice shall not be within 10 feet of insulator.

SPLICING GUIDE-COMPRESSION TYPE
A.C.S.R. CONDUCTOR

14742 ACSB 270

TUBULAR ALUMINUM SLEEVE

Sleeves marked for
conductor size and
catalog number

TUBULAR STEEL SLEEVE

A.C.S.R. READY FOR SPLICING



BEFORE COMPRESSION - TUBULAR COMPRESSION JOINT FOR A.C.S.R.



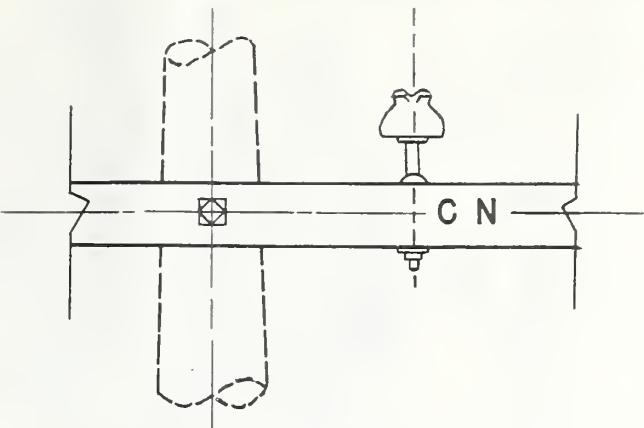
AFTER COMPRESSION - TUBULAR COMPRESSION JOINT FOR A.C.S.R.

METHOD OF APPLYING TUBULAR COMPRESSION JOINT

Caution: Before applying make sure the bores are thoroughly clean.

1. Slip the aluminum compression sleeve over one cable end and back it out of the way along the cable.
2. Using a hack saw, cut off the aluminum strands from each cable end, exposing the steel core for a distance of about $\frac{3}{8}$ " more than half the length of the steel compression sleeve. Use care not to nick the steel core with the saw. Before cutting serve the cable with wire just back of the cut.
3. Insert the steel core ends into the steel compression sleeve, making sure that the ends are jammed against the stop in the middle of the sleeve.
4. Compress the steel sleeve over its entire length, using the proper size compression dies, making the first compression at the center and working out to the ends, allowing dies to always overlap their previous position.
5. Remove serving from the cable, clean conductor by wirebrushing and slip the aluminum sleeve over the steel joint. Center the aluminum sleeve by sighting the ends of the steel joint through the filler holes provided in the aluminum sleeve.
6. Using pressure gun equipped with tapered nozzle, inject corrosion inhibitor through both holes in the aluminum sleeve until the space between it and the steel joint is completely filled. This can be observed through the filler holes. The nozzle of the pressure gun should be jammed tightly in the filler holes to prevent the paste from oozing back during injection.
7. Insert the plugs in the filler holes and hammer them firmly in place. They will be securely locked in, compressing the aluminum joint.
8. Compress the aluminum sleeve, using the proper size dies. Make the first two compressions with the inner edges of the dies matching the positions stencilled on the aluminum sleeve. Make additional compressions advancing to ends, allowing dies to always overlap previous position.

	SPLICING GUIDE - COMPRESSION TYPE A.C.S.R. CONDUCTORS 2/0, AND LARGER 1/0 OPTIONAL
Jan 1, 1962	
	M45-22



M52 - 4

IA 23

M52 - 3

May be placed

**IA
23**

instead of as shown

Notes:

1. Numbers and letters shall be of cutout aluminum or electrogalvanized soft steel, fastened to pole with galvanized or aluminum, barbed 1" round head nails.
2. Pole legends to be 1 1/2" to 3" high. If 3" characters are used, they should be placed vertically instead of as shown.
3. "CN" to be 2" high.
4. Pole to be staggered 30° from direct facing highway. When line crosses highway or R.R., legend should face same.
5. On poles having limited climbing space due to special equipment, pole legend should be so located as to leave climbing space quadrant unobstructed.

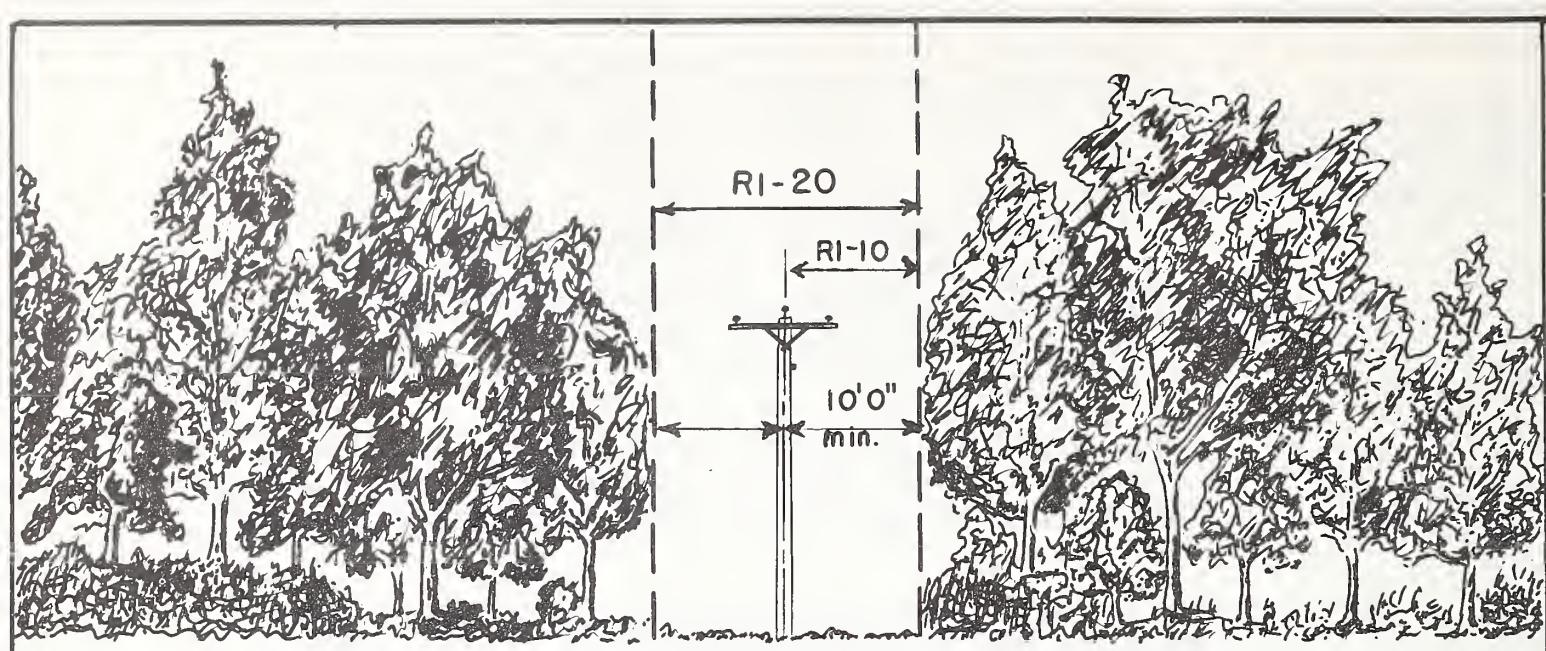
0
-
1
∞



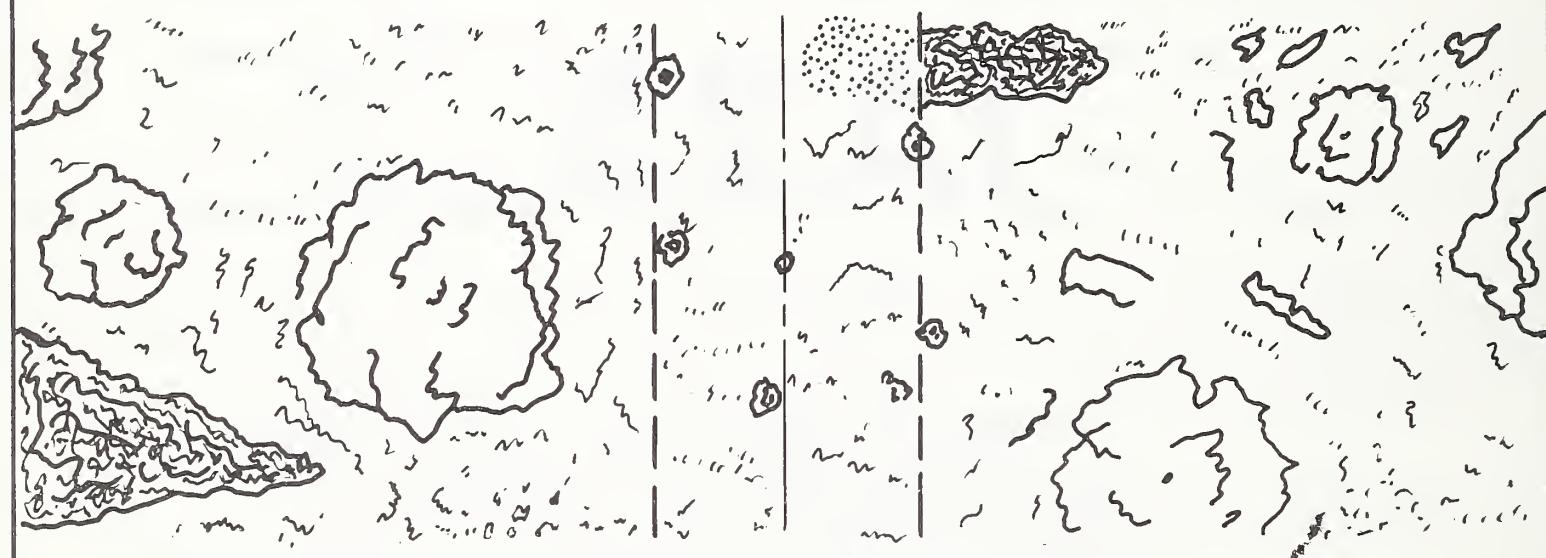
**NEUTRAL IDENTIFICATION AND
POLE NUMBERING GUIDE**

Jan 1, 1962

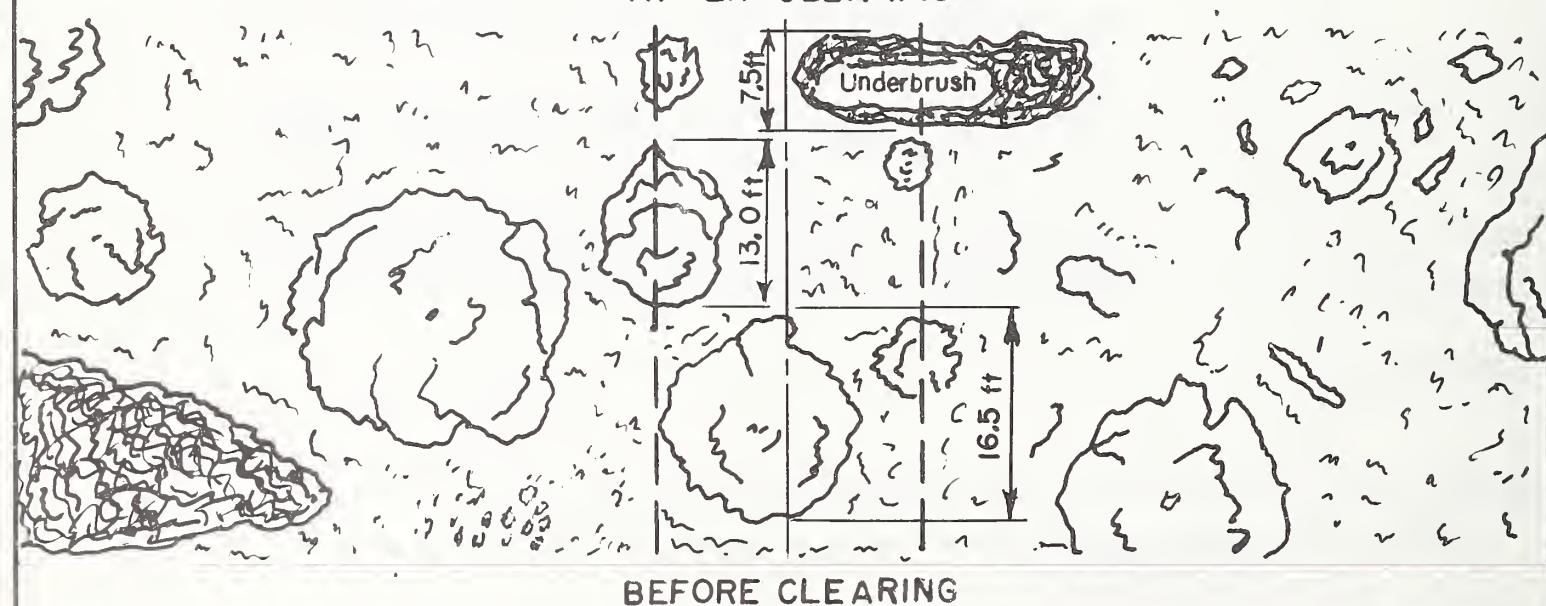
M52-3, M52-4



ELEVATION



AFTER CLEARING



BEFORE CLEARING

CLEARING RIGHT-OF-WAY GUIDE

Jan 1, 1962

RI







2

